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Licensing Polish Higher Numerals: an Account of the Accusative Hypothesis

This paper addresses the issue of the Accusative Hypothesis, which is a descriptive fact about Polish numeral expressions with higher numerals according to which they are intrinsically accusative. The hypothesis has been a debatable issue for almost the past two centuries, and remains so till today. I will argue in its favour and attempt to provide an answer as to the source of the accusative case borne by the numerals.

Keywords: numerals, Accusative Hypothesis, case syncretism, numeralisation

1. Introduction

The proposal to be presented provides a syntactic analysis of Polish cardinal numerals 5< with reference to their history and development. In particular, it provides an account the so-called Accusative Hypothesis according to which numeral expressions with 5< are intrinsically accusative[1] (Małecki 1863, Krasnowolski 1897, Szober 1928, Przepiórkowski 1996, 2004, Franks 2002). Despite it being a contentious issue[2], the Accusative Hypothesis has been used by some as an explanation to the puzzling syntax of these numeral expressions (Franks 2002, Przepiórkowski 1996, 2004, Rutkowski 2007). These proposals notwithstanding, none of them goes beyond the mere statement of the hypothesis or answers the question pertinent to the source of ACC and thus the main goal of this paper is to provide such an answer. The analysis is based on Pesetsky & Torrego's (2004) proposal according to which all structural case is a result of tense checking. It will be argued that there is a special tense head introducing numeral expressions with 5<, a (null) light *p*, whose selectional properties are

[1] Throughout the paper I will use the following abbreviations: (i) gender: M(asculine), F(eminine), N(euter), V(irile), NV(non-virile); (ii) case: NOM(inative), ACC(usative), GEN(itive), DAT(ive), INST(rumental), LOC(ative), VOC(ative); (iii) number: SG (singular), DU (dual), PL (plural).

[2] See Grappin (1942), Schabowska (1967), Doroszewski (1952), and Klemensiewicz (1952) for different views, and Schenker (1971) for an overview of these various proposals.

sensitive to the presence of a lexicalised Num^0 – the head which, it will be argued, these numerals lexicalise. The organization of the paper is as follows: in section 2, I present some historical background concerning the development of numerals; in section 3, I give an overview of their present day syntax, discuss their categorial status and propose an account of numeralisation; section 4 presents an account of the Accusative Hypothesis, and the final section 5 concludes the paper.

2. Some historical background

I concentrate here on the higher numerals 5< which constitute a larger group and are opposed to the lower (paucal) numerals 1-4. Although both groups of numerals have undergone significant changes, also with mutual interference, I devote most of my attention to the higher ones, as these have undergone an additional categorial change (noun→numeral) and are the ones which the Accusative Hypothesis concerns.

Numerals 5-10 used to be *i*-stem nouns in Proto-Slavonic and later also Old Polish (Łoś 1922: 127, Grappin 1950: 26-27, Comrie 1992: 747, Siuciak 2008: 18). As such, they possessed intrinsic φ-features (agreement features), i.e. gender, number, and case; they triggered concord on their modifiers, and required their nominal complements to stand in GEN.PL (also concerned combinations with bases: 10, 100, etc., Greenberg 1978)). Numerals 5-9 (nowadays: *pięć* 'five', *sześć* 'six', *siedem* 'seven', *osiem* 'eight', and *dziewięć* 'nine') were all F.SG nouns[3]; *dziesięć* 'ten' appeared to have both F and M versions (Comrie 1992: 748, Siuciak 2008: 18); *sto* 'hundred' belonged to *o*-stems and was unquestionably N, and *tysiąc* 'thousand'/*milion* 'million' were (and remain) M consonantal-stem nouns. All the bases initially also had PL forms which still exist within the fossilised forms of complex numerals: ***pięćset*** 'five hundred', ***sześćset*** 'six hundred', etc., expose the old PL of *sto* (*set* being GEN.PL); in isolation *sto* no longer boasts a number distinction having exclusively SG forms [4]; *tysiąc* 'thousand' and *milion* 'million', however, retain their number distinctions to this day.

All the higher numerals also inflected for case in accordance with their respective declensions. Crucially, however, to the forthcoming discussion, under the influence of the

[3] Their singularity has been ascribed to their being abstract nouns, this, however, casts doubt on the numerals denoting bases, some of which still have both SG and PL forms. Also, they are semantically parallel to the equally abstract *piatka* 'a five' (and the like) which do have PL counterparts: *piątki* 'fives', *dziewiątki* 'nines', etc..
[4] Kryński's (1900: 128) grammar is the first to prescribe using *sto* as a numeral only (Siuciak 2008: 35). Earlier, Jakubowicz (1823: 141) presented two paradigms for *sto*: numeral (exclusively SG) and nominal (SG/PL), which according to Siuciak meant that the gradual dissolution of number distinctions must have taken place in 19th c.

semantically close nouns denoting vague amounts (hence vague numerals) such as: *mało* 'little', *dużo* 'a lot', *wiele* 'many', *trocha* 'a bit' (†), etc., numerals 5< began to take on the so-called *accusative of measurement* (Szober 1928: 101-102) typical of these nouns, and in fact, their present day form is a fossilized ACC.[5] Apart from their own case, 5< also marked lexical GEN on their nominal complements. This GEN has changed from lexical to structural and has only been retained by *tysiąc* 'thousand', *milion* 'million', *miliard* 'billion'.[6]

Table 1. Lexical GEN checked by *tysiąc* vs. structural GEN checked by *sześć*

CASE	'thousand zlotys' (SG.M)		'six zlotys' (PL.NV)
NOM	$\text{tysiąc}_{\text{NOM}}$		(=ACC)
ACC	$\text{tysiąc}_{\text{ACC}}$		sześć $\text{złotych}_{\text{GEN}}$
GEN	$\text{tysiąca}_{\text{GEN}}$	$\text{złotych}_{\text{GEN}}$	sześciu $\text{złotych}_{\text{GEN}}$
DAT	$\text{tysiącowi}_{\text{DAT}}$		sześciu $\text{złotym}_{\text{DAT}}$
INSTR	$\text{tysiącem}_{\text{INSTR}}$		sześcioma $\text{złotymi}_{\text{INSTR}}$
LOC	$\text{tysiącu}_{\text{LOC}}$		sześciu $\text{złotych}_{\text{LOC}}$

Decades and hundreds exhibited properties that followed from their source simple numerals as well as combinations with them, i.e. 20-40/200-400 showed internal syntax based on agreement (just like 2-4 combined with nouns), but their external syntax reflects the properties of the simple numerals they combine with (i.e. 22 or 202 will behave like 2, and 25 or 205 like 5). We can still witness DU forms retained in (fused) complex numerals with *dwa* 'two': $\textit{dw}\mathbf{u}\textit{dziest}\mathbf{u}_{\text{ACC/GEN}}$ $\textit{żołnierzy}_{\text{GEN}}$ 'twenty', $\textit{dw}\mathbf{u}\textit{st}\mathbf{u}_{\text{ACC/GEN}}$ $\textit{żołnierzy}_{\text{GEN}}$ 'two hundred soldiers', where *–u* is the original DU ending. Technically, the matters are very much unchanged here, i.e. 2-4 remain adjectival agreeing modifiers.[7] Combinations of 5-9 with tens and hundreds, i.e. 50-90 and 500-900, again parallel the behaviour of 5-9 with nominal complements, i.e. tens and hundreds were GEN.PL (see *pięćset* above), and apart from several modifications, their syntax remains largely the same. The formation of teens made use of a preposition *na* 'on' which governed LOC (a superessive link, Greenberg 1978: 276):

[5] This cannot be seen with the originally neuter nouns *mało* 'little'/*dużo* 'a lot' whose NOM and ACC forms were syncretic, but is perfectly epitomized by the ACC *trochę* 'a bit' which outlived its no longer existing NOM *trocha*.
[6] As opposed to lexical case, structural case is overruled by oblique cases, i.e. in oblique case-contexts beyond GEN both the numeral and its complement show congruence.
[7] They inherited this status from Proto-Slavonic and though their syntax was then and is to this day primarily adjectival, their Proto-Slavonic declension varied between pronominal (*jedinъ* 'one' and *dъva* 'two', parallel to the demonstrative tъ in SG and DU respectively), and nominal (*trije/tri* 'three' and *četyre/četyri* 'four') (Comrie 1992: 805; Siuciak 2008: 17). This state is retained in Old Polish (Łoś 1927: 146-148) and reflected in the declension of *jeden* 'one' (like *ten* 'this') and *dwa* 'two' (Łoś 1922: 125); *trzy* 'three' and *cztery* 'four' started off as nouns, the former as an *i*-stem and the latter as a consonantal stem noun. Their varying history notwithstanding, 2-4 ended up as adjectives whose present form is a result of influences from both pronominal and long adjectival declensions.

(1) jedinъ na desęte/dъva na desęte/ pętь na desęte
one on ten$_{LOC}$/two on ten$_{LOC}$/ five on ten$_{LOC}$
'eleven/twelve/fifteen'[8]

An important change that affected of all numerals (though the higher ones in a particular way) was the developing category of *masculine personal gender*, hence *virile* (V), opposed to literally the rest: *non-virile* (NV). Its exponence entailed the introduction of ACC=GEN syncretism, which meant that ACC forms of virile nouns, pronouns and numerals modifying virile nouns were substituted with GEN ones. The syncretism started in SG, and via DU infiltrated PL, first affecting pronouns, then showing up with nouns accompanied by pronouns or numerals, to later include adjectives modifiers and eventually nouns on their own (i.e. without the accompanying pronouns or numerals, Łoś 1928: 111-112, Janda 1999: 216-217).

(2) 13th c. Miał dwa$_{ACC.DU}$ młoda$_{ACC.DU}$ syny/brata$_{ACC.DU}$.
14th c. Miał dwu$_{ACC=GEN.DU}$ młodu$_{ACC=GEN.DU}$ synu/bratu$_{ACC=GEN.DU}$.
15th c. Miał dwu$_{ACC=GEN.DU}$ młodych$_{ACC=GEN.\mathbf{PL}}$ synu/bratu$_{ACC=GEN.DU}$.
16th c. Miał dwu$_{ACC=GEN.(\mathbf{\sout{DU}})\mathbf{PL}}$ młodych$_{ACC=GEN.\mathbf{PL}}$ synów/braci$_{ACC=GEN.\mathbf{PL}}$.
he-had two young sons/brothers
'He had two young sons/brothers.' (Janda 1999: 216-217)

Nowadays, the V/NV distinction with the characteristic ACC=GEN syncretism is still very much alive in PL, but in SG the syncretism quite early started spreading to whole other (semantically related) classes of nouns: names of games, dances, planets, toys, decorations, cigarettes, cars etc., (Kucała 1978: 93-107), and thus cannot be treated as an exclusive V/NV characteristic; crucially for us, contexts with numerals 5< are exclusively PL, and thus the ACC=GEN syncretism can be relied on for the V/NV distinction.

Sentential agreement triggered by subjects with 1-4 depended completely on the counted noun in both Proto-Slavonic and Old Polish, showing again their adjectivehood. Subjects headed by 5< initially admitted both SG and PL verbs, i.e. either *congruentia ad formam* (formal agreement) due to the numeral being SG, or *congruentia ad sensum* (semantic agreement) due to the PL meaning of the whole phrase (Szober 1928: 97); gender agreement was triggered by the (nominal) numerals and not the counted nouns (see above):

[8] The development of teens proceeded as follows: jedinъ na desęte > jeden na desęte > jeden nadzieście > jedennaćcie > jedenaście 'eleven' (based on Comrie 1992: 766).

(3) pięć lat minęła (1447; *Słownik staropolski*)
five$_{F.SG}$ years$_{NV.PL.GEN}$ passed$_{F.SG}$
'five years have passed'

This state of the matters soon began to change and the paradigm was taken over by the common today default 3.SG.N agreement.[9] Consider the following verses from *Biblia królowej Zofii* (Queen Sophie's Bible) (1455) [10]:

(4) a. a sto waszych dziesięćtysiąców *padną* nieprzyjaciele (*BZ*, verse 8, p. 202)
and hundred your ten thousands fall$_{PL}$ foes
'and a hundred thousand of your foes will fall'

b. Wszytcy, którzyż są zliczeni (…) *było* *jest* jich pięćdziesiąt a sto
all who are counted was$_{3.SG.N}$ is$_{3.SG}$ them fifty and hundred
tysiąców a siedm tysiąców a sześćset (…) (*BZ*, verse 31, p. 212)
thousands and seven thousands and six-hundred
'Of all who are counted (...) there were 157.600 of them'

In (4a) we have plural (semantic) agreement, where we would expect SG.N to agree with *sto*, and in (4b) we have 3.SG.N agreement.

Summarising so far: the diachronic changes have left the adjectival syntax of 1-4 largely unchanged, however, the nominal numerals 5< have taken on ACC forms (*accusative of measurement*) in analogy to N nouns denoting amounts[11]; with the spreading category of virility, the ACC forms were syncretic with either GEN (V) or NOM (NV). These changes coincided with the cardinals' 5<loss of their own φ-features.[12] We thus observe structural ACC on numerals 5< in structural case-contexts; they agree with the counted noun in gender (V/NV) and at the same time continue to mark it GEN (structural) and PL. The questions that arise now

[9] Siuciak (2008: 176-179) reports that on the verge of 15th–16th c. the agreeing forms are extremely rare in texts, and the variation concerns number rather than gender (the choice is between N.SG and N.PL). It is during 16th c. that the two forms are competing, when 3.SG.N nears the norm around 1660-1670 (73%) and achieves it by 1900.
[10] The verses are from a transcription made by scholars from *Pracownia Języka Staropolskiego IJP PAN*; the whole text is available to the public at: http://www.ijp-pan.krakow.pl/pl/publikacje-elektroniczne/korpus-tekstow-staropolskich.
[11] Szober (1928) sees in that analogy the source of the 3.sg.n agreement, but it will be shown in section 3 that this cannot be so.
[12] The changes have been taking place over four centuries (16th-19th), beginning with 5-9, 10, 100, eventually affecting their combinations (multiplication and addition) in due course (Siuciak 2008).

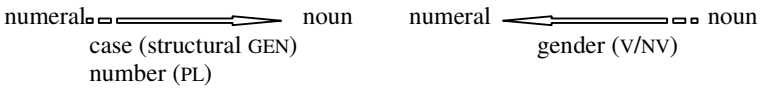
are: why the GEN changed its status, how to account for the mixed dependency relation between the numeral and its complement, and where the ACC comes from.

3. The present day syntax of 5<

3.1 What are numerals?

Answering this one question will actually give us answers to the first two questions above. By losing their intrinsic gender and number features, numerals 5< have lost an important part of their nounhood. They remain declinable as they show case and gender inflection, importantly, however, the gender is that of the counted noun, and the case paradigm of the numerals 5< is specific to them only. This last property has been taken by historians to be a sign of the emergence a new category: numeral. The numerals have also retained their ability to mark case and number on their complements.

Figure 1. Mutual interaction between numerals and their nominal complements



As already mentioned, the checked case is now structural, and structural case is characteristic of functional heads rather than lexical ones. Let us suppose that numerals 5< have changed their lexical status and have become functional heads. Because they co-occur with nouns, we can assume further that they would be part of the extended projection of the counted noun (Grimshaw 1990); this could definitely explain the mixed dependency relations shown in Fig. 1, i.e. their partly nominal behaviour would be thus expected, rather than surprising. Moreover, it would explain why they have lost their intrinsic agreement features: as functional heads, similarly to such heads as *v* or T, they can only take agreement on, rather than trigger it[13]; also, their ability to check structural case goes through without stipulation. The question now is: what functional head would numerals lexicalise? I propose here, following many others[14], that the head in question is Num^0 of Num(ber)P. The reasons are that (i) there is a close connection to the category of number, and (ii) in view of analyses

[13] The PL that numerals enforce on their complement is not shared by the numerals themselves and has been convincingly argued by Ionin & Matushansky (2006) to be semantic rather than formal, which would be in keeping with the functional head status of these numerals.
[14] For similar proposals see Giusti (1991), Bernstein (1993), Przepiórkowski (1996), and Rutkowski (2007).

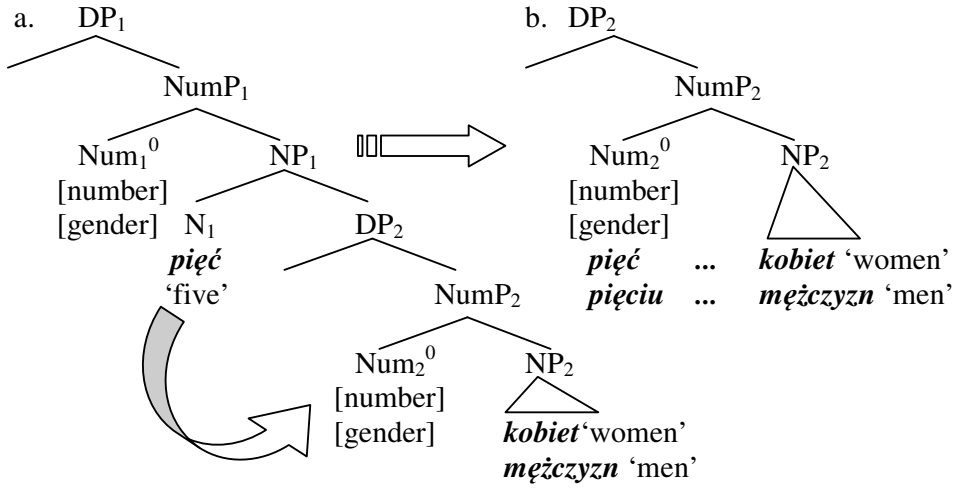
proposing gender to be parasitic on number (Ritter 1993, De Vicenzi 1999, Alexiadou et al. 2007), it would give us an answer as to why these numerals were (alongside pronouns and lower numerals) the category of choice to exhibit the newly introduced gender distinctions in PL. I propose then that we have three types of Num^0 heads with the following feature content:

(6) Number head types

a.	Num^0 [+Q] [+plural]	– numerals 5<	} numeral
b.	Num^0 [+Q] [+paucal/plural]	– numerals 2-4	} expressions
c.	Num^0 [± plural]	– unquantified noun phrases (also with 1)	

I further propose that in this process of *numeralisation*, the once nominal nouns instead of merging in their NP (N^0), merge in the counted noun's Num^0, which explains both why they have lost their own φ-features and why they exhibit the gender properties of the counted noun.[15]

(6) a. b.



That numerals 5< cannot be nominal[16] is shown by Rutkowski (2007: 216-220) who points out that, first, they have nominal counterparts in the form of *piątka* 'a five', *szóstka* 'a six', *setka* 'a hundred', which would be highly redundant. These two lexical types (*pięć* vs. *piątka*) have a very different syntax. *Piątka* and the like: have PL forms, check lexical GEN, have diminutive forms, can be counted nouns of numerals, trigger sentential agreement in

[15] Contra Rutkowski (2002), who proposes the numeral's movement to its own NumP and removing the part of the structure in between.
[16] Contra such proposals as Ionin & Matushansky (2006) and Corver & Zwarts (2006).

accordance with their intrinsic agreement features (F.SG/PL)[17], and can be used with possessive pronouns in the role of a possessee, and cannot be part of complex numerals. None of these typically nominal properties is available to numerals 5< (see fn. 17). Particularly, when it comes to sentential agreement, we only witness the aforementioned default 3.SG.N.

(7) a. Pięciu chłopców przyszło.
five$_{V.ACC}$ boys$_{GEN}$ came$_{3.SG.N}$
'Five boys came.'

b. Pięć dziewczyn/kotów przyszło.
five$_{NV.ACC}$ girls$_{GEN}$ /cats$_{GEN}$ came$_{3.SG.N}$
'Five girls/cats came.'

One could also entertain the idea that numerals have simply become N nouns; however, this proposal can be immediately discarded. As shown by Marušič & Nevins (2009), a coordinated subject with two SG.N nouns should result in PL agreement, yet coordination of two numeral expressions still yields 3.SG.N, suggesting that numeral expressions most probably do not have a gender feature to share at all (and possibly no number, either):

(8) a. Cielę **podeszło** do bramy.
calf$_{N.SG.NOM}$ came$_{3.SG.N}$ to gate
'The calf came to the gate.'

b. Cielę i szczenię **podeszły** do bramy.
[calf and puppy]$_{N.SG.NOM}$ came$_{3.PL.NV}$ to gate
'The calf and the puppy came to the gate.'

(9) Pięciu chłopców i pięć dziewczyn **przyszło** do szkoły.
five$_{V.ACC}$ boys$_{GEN}$ and five$_{NV.ACC}$ girls$_{GEN}$ came$_{3.SG.N}$ to school
'Five boys and five girls came to school.'

Further evidence comes from the selectional properties of distributive *po*, which checks LOC on its nominal complements and ACC on the numeral ones (Przepiórkowski 2006, 2008). *Tysiąc* which retains its nominal properties allows either case-marking, however, it may be LOC only so long as it is not part of a complex numeral in which case it must be marked ACC.

(10) a. Dał nam *po tysiąc /tysiącu.
gave$_{3.SG.M}$ us$_{DAT}$ po *thousand$_{ACC}$/thousand$_{LOC}$
'He gave us a thousand each.'

b. Dał nam po tysiąc /tysiącu złotych.
gave$_{3.SG.M}$ us$_{DAT}$ po thousand$_{ACC}$/thousand$_{LOC}$ zlotys$_{GEN}$

[17] This property is also retained by *tysiąc, milion,* etc. 'thousand, million' when used in isolation.

'He gave us a thousand zlotys each.'

c. Dał nam po dwa tysiące /*dwóch tysiącach złotych.
gave$_{3.SG.M}$ us$_{DAT}$ po two$_{ACC}$ thousands$_{ACC}$/ two$_{LOC}$ thousand$_{LOC}$ zlotys$_{GEN}$
'He gave us a thousand zlotys each.'

So, Polish numerals are no longer nominal and their seemingly nominal properties result from the fact that they have been reanalysed as heads of their own Num^0 (leaving N^0 for merge of a complement), and thus remaining part of the nominal extended projection.

3.2 How do we know that they are accusative?

Since Polish demonstratives are adjectival agreeing modifiers, we expect them to agree also with numerals, which they do. Depending, however, on whether they modify the numeral or the quantified noun, they agree with either one or the other (see Babby 1987 and Gvozdanović 1999). With NV nouns we have both options, i.e. a GEN demonstrative agreeing with the GEN noun, or a NOM=ACC demonstrative agreeing with the numeral: *te*$_{NOM/ACC}$/*tych*$_{GEN}$ *pięć*$_{NOM/ACC}$ *kobiet*$_{GEN}$ 'these five women'; with V nouns we only have one form: *tych* 'these', which is an ACC=GEN syncretic form: tych$_{ACC/GEN}$ pięciu$_{ACC/GEN}$ mężczyzn$_{GEN}$ 'these five men'. Crucially, the NOM form (**ci pięciu mężczyzn*) is unavailable. As the common denominator of the NOM=ACC *te* 'these' and ACC=GEN *tych* 'these' is ACC, it seems plausible that NV *te* 'these' in numeral expressions should be considered ACC, rather than NOM, or else V and NV would have very different syntax, which is not only be highly implausible, but also extremely undesirable. I summarise these conclusions in Table 2 below.

Table 2. Case paradigm of *pięć* 'five' assuming the Accusative Hypothesis (Modern Polish)

CASE	'these five men' (V)	'these five women' (NV)	'these five houses' (NV)
NOM	~~*ci pięciu mężczyzn$_{GEN}$~~	~~**te pięć kobiet$_{GEN}$**~~	~~**te pięć domów$_{GEN}$**~~
ACC	**tych pięciu mężczyzn$_{GEN}$**	**te pięć kobiet$_{GEN}$**	**te pięć domów$_{GEN}$**
GEN	**tych pięciu mężczyzn**	tych pięciu kobiet	tych pięciu domów
DAT	tym pięciu mężczyznom	tym pięciu kobietom	tym pięciu domom
INSTR	tymi pięcioma mężczyznami	tymi pięcioma kobietami	tymi pięcioma domami
LOC	tych pięciu mężczyznach	tych pięciu kobietach	tych pięciu domach

Additional evidence comes from sentential agreement: assuming numeral expressions in structural case contexts are ACC, we predict that as subjects they should parallel the behaviour

of non-nominative subjects. The agreement triggered by non-nominatives happens to be default 3.SG.N and thus the prediction is borne out (Przepiórkowski 2004:134).

(11) Pięć kobiet /Marię raziło prądem.
five$_{ACC}$ women$_{GEN}$ /Mary$_{ACC}$ struck$_{3.SG.N.}$ electricity$_{INST}$
'Five women/Mary got an electric shock.'

Further evidence comes from participial agreement where we witness ACC and GEN forms of the participle (Przepiórkowski 2004: 135):

(12) a. Sześć samolotów zostało **zakupione/**zakupionych we wrześniu.
six$_{ACC}$ planes$_{GEN}$ stayed$_{3.SG.N}$ bought$_{ACC/GEN}$ in September
'Six planes were bought in September.'
b. Sześciu niewolników zostało ***zakupieni/**zakupionych w 1768r.
six$_{ACC}$ slaves$_{GEN}$ stayed$_{3.SG.N}$ bought$_{*ACC/GEN}$ in 1768
'Six slaves were bought in 1768.'

Noting that such agreement is only possible in the passive, I propose[18] that it should be treated in terms of adjectival (participial) agreement as in Chomsky (1999), where during the cyclic movement of the object to the subject position, it must have moved through the consecutive escape hatches where at some point the participle finds itself in the scope of the numeral to receive GEN. This analysis, however, leaves unexplained the ACC case concord on the participle in (12a) (bold). I propose here that there are good reasons to believe that this concord is erroneous. We can see that only *sześć* (12a), but not *sześciu* (12b) triggers this concord, even though both are ACC forms, just in different genders (V and NV respectively). While the form *zakupionych* is undoubtedly PL, *zakupione* is ambiguous between SG.N and PL.NV. Since *sześć* apart from its numeral use may also be used as a neuter noun in definitions, or in sentences where we name or refer to the number 6 as in (13). I propose then that the concord in (12a) results from overgeneralization of the properties of the neuter noun *sześć* onto the homophonous numeral *sześć*.

(13) a. Sześć było moim szczęśliwym numerem /liczbą parzystą.

[18] Examples (12) are Przepiórkowski's, but since he does not elaborate on how the two agreement options arise, the presented analysis is my own.

six$_{SG.N.NOM}$ was$_{3.SG.N}$ my$_{M.INST}$ [lucky number]$_{SG.M.INST}$/[number even]$_{SG.F.INST}$
'Six was my lucky number/an even number.'

b. Twoje sześć jest krzywo napisane, moje sześć zostało uznane
[your six]$_{SG.N.NOM}$ is crooked written$_{SG.N}$, [my six]$_{SG.N}$ stayed$_{3.SG.N}$ claimed$_{N}$
za najładniej napisane.
for nicest written$_{N}$
'Your six [written number] is crooked, my six was deemed as written the nicest.'

The most telling example is the passive (13c) (imagine we are talking about calligraphy). Notice the forms of the participles, which can only be analysed as agreeing with the SG.N noun *sześć*. This is exactly what we see in (12a), hence I conclude that in (12a) the neuter ACC agreement on the participle is erroneous due to the reasons given above.

Another piece of evidence in favour of the Accusative Hypothesis comes from the diachronic analysis of numeralisation. Nouns that have undergone this process appear as fossilised accusatives[19] (*trochę* 'a bit' is ACC of the no longer existing neuter noun with NOM *trocha*). Szober (1928: 99-100) mentions more nouns of this kind (*mało* 'little', *dużo* 'plenty', *wiele* 'many', *kilka* 'several', etc.), which used to be neuter *o*-stems (like *sto*), however they lost their nominal properties and now due to their form and indeclinability are considered adverbial (recall that these were also the nouns which influenced numerals 5< to take on the *accusative of measurement* according to Szober (1928).

(14) Zostało trochę wody. (Przepiórkowski 2004: 136)
left$_{3.SG.N}$ bit$_{ACC}$ water$_{GEN}$
'There was left a bit of water.'

(15) a. Masa ludzi przyszła. b. Masę ludzi przyszło.
mass$_{SG.F.NOM.}$ people$_{GEN}$ came$_{3.SG.F}$ mass$_{ACC}$ people$_{GEN}$ came$_{3.SG.N}$
'(lit.) A mass (=plenty) of people came.'

In the view of numeralisation presented earlier, this would mean that these nouns were reanalysed as numerals, and instead of being merged within NP, they are now merged in Num^0 and marked ACC just like all the other numerals lexicalising Num (i.e. 5<). This would mean that the ACC *trochę* in effect survived as a lexicalisation of Num^0.

[19] Szober (1928) gives one exception: *siła* 'plenty (lit. force)' which survived in its NOM form (ACC is *siłę*).

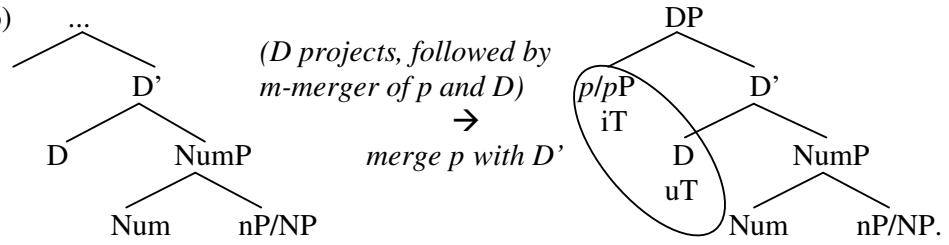
Polish numeral expressions are thus to be analysed as ACC phrases. Both numerals 5< and vague numerals have the ability to check GEN case: structural in the case of the former, and lexical in the case of the latter. The structural GEN of quantification could be argued to be nothing more than ACC under quantification (Jakobson 1984).

4. Accounting for the Accusative Hypothesis

4.1 A light preposition (*p*) as the source of ACC case in Polish numerals

Following Pesetsky & Torrego's (2004) proposals, where case is a reflection of tense, and where prepositions are also instances of tense, I make the following proposal: Polish numeral expressions are introduced by a light preposition (*p*) which constitutes the source of their ACC case. It is light in the sense that it is transparent to the outside case-checkers and theta-role assigners (Franks 2002). It is merged with D(P) (inserted at the root in accordance with the Extension Condition, Chomsky 1995); if it were to project, the phrase marker would result in a PP; instead, I propose that it does not project, but becomes the Spec of DP. Being both maximal and minimal (p^0/*p*P), it undergoes m(orphological)-merger with D (like Matushansky's (2006: 86) Saxon genitives). D projects and therefore the phrase marker remains a DP.

(16)



The light *p* represents i(nterpretable)T and its relation with u(ninterpretable)T on D results in ACC case. Its transparency to the outside case-checkers translates here into *p*'s defectivity: it is a defective iT which checks uT on D but cannot mark it for deletion (hence D's further eligibility to case-checking). P&T make a similar proposal is for unaccusative verbs assumed to have a defective φ-incomplete T_O which "acts as a probe, just like nondefective T, triggering agreement and potentially movement, but it fails to mark uninterpretable features of its goal for deletion" (P&T 2004: 512). If unaccusative verbs indeed have defective T_O, then

the Russian examples of Accusative Unaccusatives (Lavine & Freidin 2002: 258) and Polish –*no/–to* constructions constitute evidence that such a defective T checks ACC case.

(17) Russian Finite Accusative Unaccusative [*Moskovskij komsomolec* 9/13/99]

a. Soldata ranilo pulej.
soldier$_{ACC}$ wounded$_{3.SG.N}$ bullet$_{INST}$
'A soldier was wounded by a bullet.'

b. Podvaly zatopilo livnem.
basements$_{ACC}$ flooded$_{3.SG.N}$ downpour$_{INST}$
'Basements were flooded by the downpour.'

(18) Polish *-no/-to* constructions[20]

a. Marię wezwano do sądu.
Mary$_{ACC}$ called$_{3.SG.N}$ to court
'Mary was called to court.'

b. Amerykę odkryto przypadkiem.
America$_{ACC}$ discovered$_{3.SG.N}$ accident$_{INST}$
'America was discovered by accident.'

c. Marii nie wezwano do sądu.
Mary$_{GEN}$ not called$_{3.SG.N}$ to court
'Mary was not called to court.'

d. Ameryki nie odkryto przypadkiem.
America$_{GEN}$ not discovered$_{3.SG.N}$ accident$_{INST}$
'America was not discovered by accident.'

Since the ACC object of unaccusatives moves to Spec,TP, it means that its uT has not been deleted by T_O.[21] It does not exhibit NOM after checking its uT against T_S because NOM is less marked than ACC. Here, I follow Caha's (2009) analysis of case-inclusion, where NOM is analysed as the least marked case, ACC as the second least marked case and so on: each next case a composite of the previous one and some feature X. It follows then, that a DP spells out the highest (most complex) case feature and even if it later on checks another one, it will only become visible if it is more complex than the ones already borne

Numeral expressions with their visible uT (not marked for deletion by the defective light *p* (iT)) are thus eligible for probing by both T_S and T_O. Due to this, they may still interact with the tense features of the matrix probes. This is most clearly visible in the object position where the numeral expression, like any other DP, takes on the cases offered by the verbal T_O. In the subject position, similarly to the situation with Accusative Unaccusatives, the effects of NOM case checking will not be visible due to NOM being the least marked case.

4.2 Combining the two proposals: light *p* selects a lexicalised Num^0

[20] Compare (18) with a true passive, where the object is not marked ACC and becomes NOM when probed by T_S; GEN of negation cannot affect NOM subjects, even if they are underlying objects:

(i) Maria została wezwana do sądu.
Mary$_{NOM}$ stayed$_{3.SG.F/PAST}$ called$_{3.SG.F}$ to court
'Mary was called to court.'

(ii) Maria nie została wezwana do sądu.
Mary$_{NOM}$ not stayed$_{3.SG.F/PAST}$ called$_{3.SG.F}$ to court
'Mary was not called to court.'

[21] One cannot argue this ACC to be lexical, as it undergoes GEN of negation, like it is supposed to if structural.

From a purely descriptive perspective, light *p* must be assumed to select a lexicalised Num. This is because only numerals 5< and vague numerals (*masę* 'mass', *trochę* 'a bit', *kopę* 'gross', etc., as well as some distinguishing V/NV: *kilku*$_{\text{V.ACC}}$*/kilka*$_{\text{NV.ACC}}$ 'several' and *wielu*$_{\text{V.ACC}}$*/wiele*$_{\text{NV.ACC}}$ 'many'), which I have argued to lexicalise Num^0, are intrinsically ACC case. This is not far from what other prepositions co-occurring with numeral expressions select: distributive *po* selects all quantified NumPs (including paucal ones); the so-called (prepositional) adnumeral operators : approximative *z* 'around', *około* 'around', *do* 'up to', and *ponad* 'over' select not only quantified NumPs, but also M(easure)Ps. Importantly, there is a difference between these Ps and the null light *p*: lexical Ps carry particular semantics, whereas *p* does not. Nevertheless, there are important similarities between them: (i) they all allow case-transmission, and (ii) they are theta-role transmitters (the numeral expressions in their complements remain arguments of the selecting verbs). Consider examples with *około* (checking structural ACC and GEN):

(19) a. Czekałam około godziny/minuty/tygodnia. → structural GEN checked
waited$_{\text{1.SG.IMP}}$ around hour$_{\text{GEN}}$/minute$_{\text{GEN}}$/week$_{\text{GEN}}$ by *około*
'I've waited about an hour/minute/week.'

b. Było około pięć /pięciu tysięcy Polaków. → structural ACC & GEN
were$_{\text{3.SG.N}}$ around five$_{\text{ACC}}$/five$_{\text{GEN}}$ thousands$_{\text{GEN}}$ Poles$_{\text{GEN}}$ checked by *około*
'There were around five thousand Poles.'

c. Nie było około *pięć /pięciu tysięcy Polaków. → GEN of negation
not were$_{\text{3.SG.N}}$ around *five$_{\text{ACC}}$/five$_{\text{GEN}}$ thousands$_{\text{GEN}}$ Poles$_{\text{GEN}}$
'There were around five thousand Poles absent/missing.'

d. Pomogli około pięciu tysiącom Polaków. → lexical DAT checked V
helped$_{\text{3.PL}}$ around five$_{\text{DAT}}$ thousands$_{\text{DAT}}$ Poles$_{\text{GEN}}$
'They helped around five thousand Poles.'

e. Opiekują się około pięcioma tysiącami Polaków. → lexical INST checked
care$_{\text{3.PL}}$ self around five$_{\text{INSTR}}$ thousands$_{\text{INSTR}}$ Poles$_{\text{GEN}}$ by V
'They are taking care of around five thousand Poles.'

I would like to argue that *około* instantiates an overt light *p* (notice, it also checks structural case, as opposed to the lexical cases checked by regular Ps) and should also be assumed to merge in Spec,DP like the light null *p* (cf. (16)). The cases on the numeral expression in (19)

are the ones governed by the relevant verbs whenever more marked than the ones checked by *p*. The light preposition is transparent, just as expected. Also, it does not seem to project, i.e. the numeral expression remain noun phrases, and thus may be further selected by regular P such as distributive *po* (*około* behaves as if it were not there) (20). While *ponad* 'over' behaves similarly to *około* 'around' (one can substitute *ponad* for *około* in all of the above examples, although it must be noted that *ponad* may also combine with NOM), approximative *z* 'around'(hence z_{APPROX}), though transparent to case-marking and theta-role assignment, does not allow co-occurrence with distributive *po.* This might indicate that z_{APPROX} actually projects into PP above DP. There is some evidence that this indeed may be the case. In Polish we see combinations of two Ps one below the other, and interestingly, they always seem to involve a light *p* as the lower one (z_{APPROX} simply does not allow such embedding).

(20) a. Sprzedałem po (około/ponad) pięć litrów mleka. (*około/*ponad po…)
sold$_{1.SG.M}$ po$_{DISTR}$ (around/over) five$_{ACC}$ litres$_{GEN}$ milk$_{GEN}$
'I sold around five litres of milk each.'

b. Czekałem do (około/ponad) pięciu godzin. (*około do…)
waited$_{1.SG.M}$ to (around/over) five$_{GEN}$ hours$_{GEN}$
'I waited up to around five hours'

c.* Sprzedałem po z pięć litrów mleka.
sold$_{1.SG.M}$ po$_{DISTR}$ z$_{APPROX}$ five$_{ACC}$ litres$_{GEN}$ milk$_{GEN}$
'I sold around five litres of milk each.'

On the other hand, phrases with z_{APPROX} allow coordination with phrases introduced by light prepositions (null and overt, as exemplified in (21a)), which would suggest that they are of the same type and thus that z_{APPROX} is non-projecting. We can also have these coordinated phrases with light prepositions further selected by the distributive *po* (21b) (again apart from z_{APPROX}):

(21) a. Zaprosiłam dwudziestu studentów, około piętnastu doktorów i z
invited$_{1.SG.F}$ twenty$_{V.ACC}$ students$_{GEN}$ around fifteen$_{V.ACC}$ doctors$_{GEN}$ and around
pięciu profesorów.
five$_{V.ACC}$ professors$_{GEN}$
'I invited twenty students, around fifteen PhD holders and around five professors.'

b. Średnio sprzedałam po około pięć chlebów i ponad trzy litry
average $sold_{1.SG}$ po around $five_{ACC}$ $breads_{GEN}$ and over $three_{ACC}$ $litres_{ACC}$
mleka na osobę.
$milk_{GEN}$ per $person_{ACC}$
'On average I sold about five loaves of bread and three litres of milk per person.'

Apart from not allowing embedding by other Ps, z_{APPROX} has the signature properties of a light *p*, i.e. it allows case-transmission and Θ-role transmission. I will thus continue assuming that it is a light non-projecting *p*, pending further research. That m-merger does take place gains support from the examples with pronouns and numerals which can never co-occur with overt light prepositions, but do, as argued here, co-occur with the null one. If, as I assume, pronouns are in D, then m-merger of an overt light P and overt material in D is impossible, although a null light P will not be problematic due to its missing morphophonological realisation, hence we have *nas pięciu* 'us five' (with a null light *p*), but never: **około nas pięciu* (rather *około pięciu z nas* 'around five of us'), **ponad nas pięciu* (rather *ponad pięciu z nas* 'over five of us') with an overt light *p*.

There is more supporting evidence for the prepositional analysis and it comes from a related language, Serbo-Croatian (SC). Franks (2002) and Giusti & Leko (2004) discuss properties of the numeral expressions in SC and there is one particularly interesting property with respect to the analysis presented here: numeral expressions with 5< cannot occur in oblique case positions unless preceded by a preposition (examples from Franks 2002: 166, and Giusti & Leko 2004: 127, 135).

(22) a. Bojao sam se pet ljudi.
feared $aux_{1.SG}$ REFL five $people_{GEN}$
'I feared five people.'

b. Čuvao sam se pet ljudi.
guarded $aux_{1.SG}$ REFL five $people_{GEN}$
'I guarded myself against five people.'

c. Domogao sam se pet knjiga.
obtained $aux_{1.SG}$ REFL five $books_{GEN}$
'I obtained five books.'

(23) a. */?? Jovan je pomagao pet ljudi.
Jovan $_{3.SG}$ helped five $people_{GEN}$
'Jovan helped five people.'

b.* Ivan upravlja pet fabrika.
Ivan manages five $factories_{GEN}$
'Ivan manages five factories.'

(24) a.* Ivan upravlja tri fabrike.

b. Ivan upravlja trima fabrikama.

Ivan manages three factories$_{GEN}$
'Ivan manages three factories.'

Ivan manages three$_{INST}$ factories$_{INST}$
'Ivan manages three factories.'

(25) a.* Predsjednik vlada pet zemalja.
president rules five countries$_{GEN}$
'The president rules five countries.'

b. Predsjednik vlada **sa** pet zemalja.
president rules with five countries$_{GEN}$
'The president rules five countries.'

c.* Jovan je rukovodio pet fabrika.
Jovan $_{3.SG}$ managed five factories$_{GEN}$
'Jovan managed five factories.'

d. Jovan je rukovodio **sa** pet fabrika.
Jovan $_{3.SG}$ managed withfive factories$_{GEN}$
'Jovan managed five factories.'

(26) a. Predsjednik vlada (***sa***) zemljom.
president rules country$_{INST}$
'The president rules the country.'

b. Jovan je rukovodio (***sa***) jednom fabrikom.
Jovan $_{3.SG}$ managed one$_{INST}$ factory$_{INST}$
'Jovan managed one factory.'

According to Franks (2002: 166), numeral expressions with 5< are fine in lexical GEN contexts because they are licensed in GEN DPs (23a-c); due to this, however, they are ungrammatical in DAT (23a) and INST (23b) contexts as lexical case cannot be trumped by any other case (lexical or otherwise), even if it is a more marked one. It is only with the indeclinable 5< (25) (Giusti & Leko 2004: 127) that the preposition is necessary in oblique case-contexts beyond GEN; with the declinable 1-4 (see (24b) and (26b)), the situation parallels that in Polish: 1-4 are adjectival (Comrie 1992), are not Num heads, and cannot assign GEN to their complement. What is particularly interesting is that this preposition is otherwise disallowed with the very same verbs if the object is not a numeral expression, or if it contains numerals 1-4, which is proved by the examples in (26). Franks refers to *sa* as a light preposition and I have adopted this term to apply to my null *p*. He claims that it is inserted as a last resort mechanism to take on the lexical case that the numeral expression cannot take on. It is also responsible for transmitting the theta-role assigned by the verb. As we can infer from the above examples, the absence of *p* with *tri* 'three' (24b) and *jeden* 'one' (26), i.e. paucal adjectival numerals which I assume to be specifiers of NumP, the SC overt *p* shows selectional properties of my earlier proposed Polish null light *p*: it selects lexicalised Num heads (which is also why it does not co-occur with paucal numerals in either language).

Franks (2002) suggested that SC numeral expressions are licensed in Gen contexts, but this would make SC very different from Polish or Czech. I propose a common analysis of these languages. The fact that numeral expressions are available in GEN contexts in (22) without the overt *p* may simply result from the ACC=GEN syncretism also present in Serbo-

Croatian; just like it is impossible to tell the difference between Polish ACC and GEN of *pięciu*$_{ACC/GEN}$ 'five' in examples like: *Widziałem pięciu*$_{ACC}$ *mężczyzn*$_{GEN}$ 'I saw five men' vs. *Bałem się pięciu*$_{GEN}$ *mężczyzn*$_{GEN}$ 'I feared five men,' so it is impossible to tell the difference between ACC and GEN of *pet ljudi* 'five people' in SC (22). This need not mean that all numeral expressions in SC are GEN, they may as well be ACC just like their Polish counterparts. Thus SC (22) is reminiscent of Polish where the ACC virile numeral expressions find themselves in ACC or GEN case contexts (as in the examples cited above). The difference between Polish and SC is that Polish 5< are declinable and exercise the V/NV gender distinction, which ensures a way of distinguishing ACC from GEN thanks to the NV NOM=ACC syncretism: *Widziałem pięć*$_{ACC}$ *kobiet*$_{GEN}$ 'I saw five women' vs. *Bałem się pięciu*$_{GEN}$ *kobiet*$_{GEN}$ 'I feared five women.' The fact that the preposition surfaces in SC in oblique case contexts may possibly be connected to the indeclinability of these numerals. In Polish 5< are declinable and thus able to take on the oblique cases, in SC this job is performed by *p*, as proposed by Franks.

5. Conclusion

The presented analysis has been inspired by Pesetsky & Torrego's (2004) idea that case is a reflection of tense checking. Since Polish numeral expressions have been believed for almost two hundred years to be intrinsically ACC (the Accusative Hypothesis) and no one so far has answered the question of where this ACC from, it only made sense to investigate this puzzling issue. I began with an overview of Polish cardinals emphasising their diachronic development, which is where I found the original source of this ACC: it stemmed from the assimilation of the *accusative of measurement* by 5-9 from vague numerals, some of which survived to this day as fossilised accusatives, and was further strengthened by the introduction of the ACC=GEN syncretism in the PL. I have also proposed how numeralisation of numeral nouns into numerals proceeded in Polish in the way that complements the Accusative Hypothesis, i.e. they began to lexicalise (their own, earlier nominal) Num^0. To account for the syntactic source of ACC, I presented data pointing to the existence of a light null *preposition*, which in Pesetsky & Torrego's (2004) analysis would instantiate a defective tense head able to check uT on D, but unable to mark it for deletion. A defective tense head of this type has been shown to exist in Accusative Unaccusative and –no/–to constructions, both of which have (structural) ACC subjects. The light *p* which selects a lexicalised Num^0 has been argued

to instantiate a similar case-checker, and thus shown to check ACC against the contents of Num^0. Empirical evidence from Polish and the related Serbo-Croatian was given in support of the existence of overt light *p*s. As an upshot of these findings, it has also been proposed that the numerals systems of Polish and Serbo-Croatian are more alike than so far assumed.

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