1 Introduction

Quantificational elements, such as numerals, quantifiers, and nouns used in a quantificational way, are often subject to idiosyncratic behavior, making them difficult to categorize (see attempts in e.g., Corbett 1978, Kayne 2005, Zweig 2005, Corver and van Riemsdijk 2001, etc.).

→ If all quantificational items in a language behaved similarly, it would be simple to suggest a category Q to capture their behaviors. But, more often than not, quantificational items have slightly differing morphosyntactic behaviors, requiring a more nuanced view.

Let me give some English examples, just to show how difficult the issue of categorization is.

English:

> Numerals 100, 1000, etc. obligatorily occur with an indefinite article in indefinite contexts; but, they trigger plural demonstrative and verbal agreement.

(1) *(A) hundred students
(2) These hundred students were sleeping.

These numerals can inflect as plural, in which case they require of on the noun.

(3) Hundreds of students

> Other numerals in English also trigger plural demonstrative and verbal agreement, but they do not co-occur with an indefinite article. Likewise, they cannot pluralize.

(4) (*A) sixty students
(5) These sixty students were sleeping.
(6) “Sixties of students

> Like 100, the quantifier a few (meaning “some”; it differs in meaning from few, “not many”)¹ requires indefinite a, and triggers plural verbal agreement.

(7) A few students were sleeping.

¹ It also differs with regards to polarity, e.g. (*A) few would ever consider this.
But unlike 100, it cannot co-occur with a demonstrative (then it acquires the meaning of few) and it cannot pluralize.

(8) *These few students were sleeping. (∗a few ‘some’, ✓ few ‘not many’)
(9) *Fews of students

- Quantificational nouns like number also co-occur with an indefinite article and trigger plural verbal agreement. But, unlike 100, they always require the noun following them to be preceded by of.

(10) A number *(of) students were sleeping.

If they combine with a demonstrative, they seem to lose their quantification meaning; additionally, unlike 100, they cannot pluralize in their quantificational usage.

(11) This / *these number of students was sleeping.
(12) *Numbers of students were sleeping.

Putting these results together, we find a variety of behaviors with quantificational elements:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>of</th>
<th>Pluralizes?</th>
<th>Verb Agr</th>
<th>Dem Agr</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>PL</td>
<td>PL</td>
</tr>
<tr>
<td>a few</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>a number</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>✓</td>
<td>✓</td>
<td>✓ (if PL)</td>
<td>✓</td>
<td>PL</td>
</tr>
</tbody>
</table>

Clearly, from this little exercise, not all Q-items are Q in the same way. Instead, they vary according to whether they combine with an indefinite article, if they need of, if they can pluralize, combine with a demonstrative, etc.

Approach: I take the perspective that Q-items are constructed categories, borrowing, often, from the inventories of nouns and adjectives (cf. Wiltshcko 2014). They are “semi-lexical” (see Emonds 1985, Corver and van Riemsdijk 2001), and must be considered on a case-by-case basis. I believe we can understand their idiosyncracies, if we first understand their feature composition and structure.

The talk: In this talk, I will explore certain idiosyncracies of Q-items, focusing on numerals.

Roadmap:
- What the combination of numerals and pluralia tantum nouns tells us about their feature composition.
- How the feature compositions of numerals interact with case.
- The interaction of Q-items with agreement in English.
2 A case study: Numerals and pluralia tantum nouns

There is an interesting restriction on the combination of numerals with pluralia tantum nouns, where certain classes of numerals are ungrammatical, while others are not. This is related to the feature composition of the numerals, and we will explore this here.

2.1 What’s the problem?

Pluralia tantum nouns are nouns which are morphologically plural, triggering plural agreement, despite referring to both singular and plural quantities.

(14) These scissors are dull. (= 1 or more pairs of scissors)
(15) Te nożyczki są tepe. (Polish)
    DEM.NV.PL scissors are DILL.NV.PL
    ‘These scissors are dull.’ (= 1 or more pairs of scissors)

Numerals in English cannot combine with a pluralia tantum noun.

(16) *One scissors is/are dull.
(17) *Two scissors are dull.

Instead, some intervening measure phrase is necessary.

(18) One pair of scissors is dull.
(19) Two pairs of scissors are dull.

Numerals in Polish show a similar pattern, but it differs as to which numerals can combine with a pluralia tantum noun. Numerals 1 and 1000 can, but numerals in between cannot.

(20) Jedne drzwi / sanie Numeral 1
    One.NV.PL.NOM door.PL.NOM / sleigh.PL.NOM
    ‘One door / sleigh (lit. one doors/sleighs)’
(21) *Trzy drzwi / sanie *Numerals 2-4
    Three.NV.NOM door.PL.NOM / sleigh.PL.NOM
    Intended: ‘Three doors / sleighs’
(22) *Pięć drzwi / sań *Numerals 5-10 and 100
    Five.NOM door.PL.GEN / sleigh.PL.GEN
    Intended: ‘Five doors / sleighs’
(23) Tysiąc drzwi / sań Numerals 1000+
    Thousand.M.SG.NOM doors.PL.GEN / sleigh.PL.GEN
    ‘A thousand doors / sleighs’

Instead, they require the use of a special collective numeral, or, like English, an intervening measure phrase.

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2 This judgment seems less strong when we try higher, more complex numerals, e.g. I just got a shipment of 2736 (pairs of) pants.
We find similar facts in Finnish (see Brattico 2010, 2011). With count nouns (in structural case positions), Finnish numerals from 2 onwards trigger partitive singular case on the noun, and themselves remain invariant.

(26) Kaksi mies-tä nukkui.
    Two men-SG.PRT slept
    ‘Two men slept.’ (Brattico 2011: 1042, ex. 1)

In this pattern, they cannot combine with pluralia tantum nouns.

(27) *Minä näin kaksi saks-ia / saks-ea.
    I saw two scissors-PL.PRT/scissors-SG.PRT
    ‘I saw two scissors.’ (Brattico 2011: 1045, ex. 6b)

Instead, to express the reading of “two pairs of scissors,” the numeral must inflect as plural, which in turn, causes it to lose its ability to trigger partitive case.

(28) Minä näin kahde-t sakse-t
    I saw two scissors-PL.ACC/scissors-ACC.PL
    ‘I saw two scissors.’ (Brattico 2011: 1045, ex. 6a)

Related patterns are found in multiple languages. Serbian, as described by Šarić (2014), disallows pluralia tantum nouns with the paucal numerals (2-4); instead, they require the intervention of some measure phrase.

(29) *Dve makaze / makaza
    Two scissors.F.PL.NOM / scissors.F.PL.GEN
    ‘Two scissors’ (Šarić 2014: 42, ex. 51c)

(30) Dva para makaza su otupela.
    Two pair.M.SG.GEN scissors.F.PL.GEN is blunt
    ‘Two pairs of scissors got blunt.’ (Šarić 2014: 42, ex. 51d)

Numerals 5-20, on the other hand, combine unproblematically.
A similar paradigm is repeated in Russian, which disallows *pluralia tantum* with the paucals (2-4), but not with higher numerals (Pesetsky 2013).

What we see is that in multiple languages, the combination of a numeral with a *pluralia tantum* noun is banned. However, this restriction is relevant only for certain numerals, other numerals combining unproblematically.

### 2.2 The structure of *pluralia tantum* nouns

Ritter (1991, 1992), among others, argued for the presence of a #P in languages, between DP and NP, which hosts number morphology. This hypothesis has since become standard.

But, the structure is not very insightful for *pluralia tantum*, as it gives us no understanding of why the noun must always be plural. The plural feature seems to be inherent to the noun.

The inherent plurality of *pluralia tantum* is acknowledged by Borer (2005: 106), Acquaviva (2008: 5), Kramer (2009: 173, fn. 5), Alexiadou (2011), and Smith (2015). The common approach is to take the plural of a *pluralia tantum* noun to occur on the categorizing *n* head.

Smith (2015) explicitly blocks *pluralia tantum* nouns from combining with a #P (since we never get double number morphology):

Let us assume this as the basic difference; we get the following subtrees for a *pluralia tantum* noun and a plural count noun:
(35) a. Plural Count Noun

```
... #P
  # √
[PL]
```

b. Pluralia Tantum Noun

```
... √ P
  # √
[PL]
```

For numerals that cannot combine with pluralia tantum nouns, we immediately have an explanation: the numeral can only combine with nouns which project a #P.

(36) **Generalization:** Some numerals require the noun they combine with to have #P.

**Why?** I propose that this is related to the structure and feature composition of the numeral. The generalization seems to be that numerals which lack any specification of number inherent to them (numberless numerals), are incapable of combining with pluralia tantum nouns.

I will illustrate this through a case study of Polish numerals.

### 2.3 Polish numerals and the pluralia tantum problem

There are four classes of numerals in Polish: numeral 1, numerals 2-4, numerals 5-10, 100 (5+ for short), and numerals 1000 and greater (1000+ for short).

#### 2.3.1 Numeral 1

Numeral 1 is an adjective in Polish: it agrees for gender, number, and case regardless of syntactic context. This is shown below for a masculine and feminine noun. Its inflectional paradigm is near identical to the paradigm of an adjective.³

(37) Jeden ptak spał.
    ‘One bird slept.’

(38) ...z jednym ptakiem
    withINST one.M.SG.INST bird.M.SG.INST
    ‘with one bird’

(39) Jedna dziewczynia spała.
    One.F.SG.NOM girl.F.SG.NOM slept.F.SG
    ‘One girl slept.’

(40) ...z jedną dziewczyną
    withINST one.F.SG.INST girl.F.SG.INST
    ‘with one girl’

³ There are two small differences, mirrored in the forms of demonstratives. Rather than the expected jedny for masculine singular, we get jeden, and rather than the expected jedne for neuter singular, we get jedno; demonstratives also differ from adjectives in these two endings: t-en.M.SG.NOM, t-on.F.SG.NOM.
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Leiden University

Numeral 1 can combine with plural nouns which are *pluralia tantum*, as well as regular count nouns, in which case it seems to mean “some.” In both cases, it is agreeing in NUMBER.

(41) Jedne drzwi / sanie
One.NV.PL.NOM door.PL.NOM / sleigh.PL.NOM
‘One door / sleigh (lit. one doors/sleighs)’

(42) Jedne dziewczyny spały.
One.NV.PL.NOM girls.F.PL.NOM slept.NV.PL
‘Some girls slept.’

I conclude from this that numeral 1 is an adjective, and as an adjective, agrees in NUMBER, GENDER, and CASE with the noun it quantifies. Crucially, the numeral has agreeing NUMBER.

2.3.2 *Numerals 1000+*

Numerals 1000+ are nouns in Polish, although their ability to trigger verbal agreement when singular is contingent on there being an agreeing modifier.4

(43) Cały tysiąc ptaków spał.
Whole.M.SG.NOM thousand.M.SG.NOM birds.GEN slept.M.SG
‘A whole thousand birds slept.’

If the modifier agrees with the noun, or takes default agreement, the verb inflects as default.

(44) Cale tysiąc ptaków spało.
Whole.NV.PL.(DEF) thousand birds.GEN slept.N.SG(DEF)
‘A whole thousand birds slept.’

(45) Całych tysiąc ptaków spało.
Whole.PL.GEN thousand birds.GEN slept.N.SG(DEF)
‘A whole thousand birds slept.’

Note that the numeral always triggers genitive case on the noun, even in oblique environments; this is a noun-like behavior.

(46) …z tysiącem ptaków
with[INST] thousand.M.SG.INST birds.GEN
‘with a thousand birds’

Like a noun, the numeral can occur in the singular or the plural (which optionally triggers verbal agreement). This tells us that the numeral is specified for NUMBER.

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4 Not just any modifier can agree with the numeral; speakers differ on which modifiers they allow to agree with the numeral, and even then, the modifier only agrees optionally. What does seem to be true across speakers is that verbal agreement is permitted only if there is some agreeing modifier present.
a. Tysiąc ptaków spało.  
   Thousand birds.Gen slept.N.sg  
   ‘A thousand birds slept.’

b. Tysiące ptaków spało / spały.  
   Thousands birds.Gen slept.N.sg(Def) / slept.Nv.pl  
   ‘Thousands of birds slept.’

When the numeral is inserted in complex-numeral contexts, it behaves as the quantified noun would, surfacing obligatorily as plural, and taking either nominative (numerals 2-4) or genitive case (numerals 5+) in subject position.

a. Dwa tysiące ptaków spało.  
   Two.m.nom thousands.nom birds.gen slept.N.sg(Def)  
   ‘Two thousand birds slept.’

b. Pięć tysięcy ptaków spało.  
   Five thousands.gen birds.gen slept.N.sg(Def)  
   ‘Five thousand birds slept.’

I analyze the numerals 1000+ as basically being nouns, but nouns, which, due to being in a state of grammaticalization, have the option of omitting GENDER (γ).

(49) 1000: [# šること/니, (γ M [I]) ]

The presence or absence of γ (GENDER) is what accounts for the patterns in agreement. If γ is present, the numeral behaves like a noun triggering full agreement.

(50) [TP T [vP [DP D...1000...N] [v’ v ... [___π, __#, __γ] [π, #, γ] ]

If γ is absent, the numeral is deficient, and hence, triggers default verbal agreement. This occurs regardless of whether the modifier has agreed with the numeral (and hence, is also deficient), or with the noun (and hence, is genitive, and inaccessible to agreement), assuming the modifier to be the first set of phi-features the probe encounters.5

(51) a. [TP T [vP [DP D...1000...N] [v’ v ... [___π, __#, __γ] [π, #] ]

b. [TP T [vP [DP D...1000...N] [v’ v ... [___π, __#, __γ] [π, #, γ]Gen

Crucially, numerals 1000+ have no issues combining with pluralia tantum nouns.

5 I propose (building on an idea in Ionin and Matushansky, under review) we model this in terms of which feature “takes precedence” in the agreement relation. If #, the modifier will be forced to agree with the numeral, resulting in unvalued γ; if γ, the modifier will find the noun instead, and therefore, be marked as genitive.
If my hypothesis is correct, this follows because the numeral always has its own # feature, regardless of the representation of the noun.

(53) 1000: [[#P SG/PL (γP) (γM [I]) 1000]]

2.3.3 Numerals 2-4

Numerals 2-4 at first glance look like adjectives. They agree in GENDER with the noun, and are accompanied by full verbal agreement and nominative case, regardless of GENDER.

(54) Dwie / trzy / cztery dziewczyny spały.  
Two.F.NOM / three.NV.NOM / four.NV.NOM girls.F.NOM slept.NV.PL  
'Two / three / four girls slept.'

(55) Dwa / trzy / cztery ptaki spały.  
Two.M/N.NOM / three.NV.NOM / four.NV.NOM birds.M.NOM slept.NV.PL  
'Two / three / four birds slept.'

(56) Dwaj / trzej / czterej chłopcy spały.  
Two.V.NOM / three.V.NOM / four.V.NOM boys.M.NOM slept.V.PL  
'Two / three / four boys slept.'

But, in addition, virile nouns (optionally) show a pattern of genitive marking on the numeral and noun, which triggers default verbal agreement.

(57) Dwóch / trzech / czterech chłopców spało.  
Two.GEN / three.GEN / four.GEN boys.GEN slept.N.SG(DEF)  
'Two / three / four boys slept.'

The agreeing pattern suggests that the numerals have probing GENDER. The genitive pattern, as we will see shortly, suggests that these numerals can pattern with 5+.

What about NUMBER?

Despite being very adjective-like (aside from the pattern in (57)), the numerals only seem to have a plural paradigm. This is apparent through the fact that they are sensitive to virility in Polish, but not animacy:

**Animacy:** The masculine gender in Polish makes an animate-inanimate distinction. This distinction is only relevant in the singular.

**Virility:** The masculine gender in Polish makes a virile, non-virile distinction (virile = masculine grammatical gender, male natural gender, cf. Rappaport 2011). This distinction is only relevant in the plural.

→ This could mean that either they are pluralia tantum, or they are numberless.
- **Pluralia tantum**: They are inherently plural, hence their inability to express singular.
- **Numberless**: They lack number altogether, hence their inability to express singular.\(^6\)

If inherently plural, the agreeing variant (putting aside (57) for now which I treat with the 5+ numerals) has plural NUMBER, agreeing GENDER.

(58) 2-4: \([\text{PL, } \gamma]\)  \(\text{(Pluralia tantum 2-4)}\)

If numberless, the numerals only have agreeing GENDER.

(59) 2-4: \([\gamma]\)  \(\text{(Numberless 2-4)}\)

Again, we’ve seen that these numerals do not combine with *pluralia tantum*:

(60) *Trzy drzwi / sanie*

Three.NOM door.PL.NOM / sleigh.PL.NOM

Intended: ‘Three doors / sleighs’

If numberless, we can relate this fact to the numberlessness of the numeral; if *pluralia tantum*, it’s not so clear what the source of the problem is.

2.3.4 **Numerals 5+ (5-10, 100)**

The numerals engage in (what I analyze as) a gender-conditioned case alternation, reminiscent of what we just saw with 2-4 virile nouns (57); the numerals are in a “nominative” form with non-virile nouns and a “genitive” form with virile nouns.\(^7\)

(61) Pięć ptaków

Five birds.GEN

‘Five birds’

(62) Pięciu chłopców

Five.GEN boys.GEN

‘Five boys’

Willem (2015), building on Rappaport (2003), analyzes the case alternation as the result of a spell-out mechanism for default case on the numerals: default case associated with virile nouns takes –u (genitive), and default case associated with non-virile takes a null ending.

(63) \(\text{Pięć-}\left[\_\text{CASE}\right] \rightarrow -u / \_ [\text{PL}_#, \text{MH}_3]\)  \(\text{Willim (2015: 350)}\)

\(\rightarrow \emptyset / \_\) (Elsewhere)

\(^6\)This is under the assumption that the grammar might find some way to make use of the possibility of a singular 2-4 numeral; the language clearly repurposed numeral 1 in combination with plural count nouns (cf. (42)), so there is no reason, in principle, to believe it could not do the same with 2-4.

\(^7\)The literature consists of two hypotheses which are both morphologically plausible, but differ with regards to the assumptions required to derive them. I assume the Nominative(NV)-Genitive(V) Hypothesis (see Doroszewski 1952; Klockmann (2015)), not the more standard Accusative Hypothesis (see e.g. Franks 1994, 2002; Przepiórkowski 2004; Miechowicz-Mathiasen 2012, among others).
For this to work, we must assume that these numerals lack case, regardless of their feature content.

Note that we can understand the genitive pattern of numerals 2-4 (cf. (57)) as also being the result of caselessness, assuming only virile nouns allow this caselessness.

Assuming there is no structural difference in the numeral between agreeing 2-4 and caseless 2-4, it follows that there must be some featural difference. If the numeral is always numberless, then the difference must lie in GENDER, where caseless 2-4 are most likely not agreeing in GENDER. This result applies to 5+ by association.

I assume here: (a) case alternating 2-4 and 5+ are caseless and (b) case alternating 2-4 and 5+ do not agree in GENDER.

Open questions: What is the relation of these numerals to GENDER if it is not agreement? How does the spell-out mechanism reference the GENDER of the noun?

Turning to verbal agreement, the numerals 5+ always trigger default agreement. This, along with the caselessness, are clues that the construction is deficient in some way.

(64) Pięć ptaków spało.  
      Five birds.GEN slept.N.SG(DEF)  
      ‘Five birds slept.’

What is the status of NUMBER?

The numerals lack a singular paradigm, and their default spell-out mechanism shows sensitivity to virility, this usually being symptomatic of plurality. Like 2-4, they could either be inherently plural (pluralia tantum) or lack # altogether.

Again, these numerals do not combine with pluralia tantum nouns.

(65) *Pięć drzwi / sana  
     Five.NOM door.PL.GEN / sleigh.PL.GEN  
     Intended: ‘Five doors / sleighs’

If numberless, we can relate this fact to the numberlessness of the numeral; if pluralia tantum, it’s not so clear what the source of the problem is.

2.3.5 Intermediate conclusions

Let’s put our various conclusions together:

- Numeral 1 shows agreement for NUMBER. Thus, it has NUMBER.
- Numerals 1000+ inflect for singular or plural. Thus, it has a #P projection.
- Numerals 2-4 and 5+ are consistent both with being inherently plural or lacking number altogether.

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8 We could assume that these numerals have a different structure when virile versus non-virile (cf. Willim 2015, fn. 2), but I think ideally, we should assume they have the same structure if we can.
Now, we know it is not the fact of being a numeral that is a problem as 1 and 1000+ combine with pluralia tantum nouns. It must be related to idiosyncratic properties of the numerals.

Considering GENDER and NUMBER,

- GENDER does not correlate in any way with this problem – between numerals 1 and 1000, we have agreeing gender, specified gender, and missing gender, all acceptable.
- NUMBER does correlate; if we assume number is missing with 2-4 and 5+, but not 1 or 1000, then it is the numerals lacking NUMBER that do not combine with pluralia tantum.

Therefore, I propose that numerals 2-4 and 5+ are numberless, this being the source of the problem with pluralia tantum nouns.

This gives us our generalization, hinted at previously:

(66) **Generalization:** Numerals which lack any inherent number specification (either through projecting NUMBER or agreeing for NUMBER) must combine with a noun which projects #P.

### 2.4 Another example: Numerals and pluralia tantum in Finnish

There are two classes of numerals in Finnish: numeral 1 and numerals greater than 1 (2+).

Numeral 1 appears to be an adjective, playing no role in case assignment.

(67) Yksi mies nukkui.
    One.SG.NOM man.SG.NOM slept.SG
    ‘One man slept’ (Brattico 2011: 1043, ex. 2a)

As an adjective, numeral 1 shows agreement with pluralia tantum nouns, inflecting as plural; this is the same as in Polish.

(68) Minulla on vain yhdet simälasit.
    1SG.ADESS be.3SG only one.PL.NOM glasses.PL.NOM
    ‘I have only one pair of glasses’ (Sakuma 2008, ex. 7)

Numerals 2+ trigger partitive case morphology on the quantified noun. The numeral itself is apparently singular, as is verbal agreement.9

(69) Kaksi mies-tä nukkui.
    Two men-SG.PRT slept.3SG
    ‘Two men slept.’ (Brattico 2011: 1042, ex. 1)

---

9 Verbal agreement might actually be default here, but we can’t tell, given this example. The relevant test would be coordination, to see whether two numeral phrases could produce plural verbal agreement.
The numeral can also appear in a plural form with count nouns, but the interpretation differs, being something closer to sets or pairs (see the discussion in Hurford 2003); if the numeral is plural, the noun must also be plural, and partitive case does not appear.

\[(70)\]
\begin{verbatim}
Kahdet paperit
Two.PL papers.PL
\end{verbatim}

‘Two sets of papers’ (Hurford 2003: 35)

With *pluralia tantum* nouns, the usual pattern partitive singular pattern is blocked, and instead the numeral must appear in its agreeing plural form, which is accompanied by plural on the noun (and no partitive).

\[(71)\]
\begin{verbatim}
*Minä näin kaksi saks-ia / saks-ea.
I saw two scissors-PL.PRT/scissors-SG.PRT
‘I saw two scissors.’ (Brattico 2011: 1045, ex. 6b)
\end{verbatim}

\[(72)\]
\begin{verbatim}
Minä näin kahde-t sakse-t
I saw two-PL.ACC scissors-ACC.PL
‘I saw two scissors.’ (Brattico 2011: 1045, ex. 6a)
\end{verbatim}

Now, if we suppose that the numeral in (69) and (71) is actually numberless, as opposed to singular (this being morphologically indistinguishable), these facts becomes extremely similar to Polish: the numeral is blocked in this environment because no #P is present. Instead, the numeral is only permitted if it agrees for NUMBER.

Based on the discussion thus far for Polish and Finnish, we now turn to a possible structural analysis of these numerals. We will use these structures to further explore issues of case.

### 3 Structural Considerations

We’ve seen two types of numerals with some kind of number specification:
- Numeral 1 in Polish and Finnish, with agreeing NUMBER.
- Numeral 1000 in Polish, with a #P.

And we’ve seen numberless numerals:
- Numerals 2-4 in Polish (regardless of the status of GENDER)
- Numerals 5+ in Polish (regardless of the status of GENDER)
- Numerals 2+ in Finnish

In this section, I will provide structures for the numerals.

**Numeral 1 (Fin/Pol):** Numeral 1 is an adjective, merging as a specifier. I place it in a QP.
Numeral 1000 (Pol): Numeral 1000 is itself a noun. We have two options structurally — either it is a specifier, or it is a head, with its own dominating functional structure (see Danon 2012 for discussion). Following Ionin and Matushansky (2006), I take it to be a head; it does not combine with a full DP.

Numerals 2-4, 5+ (Pol): Following Ionin and Matushansky (2006), I take these to be some kind of Q head;\(^\text{10}\) I assume them to be generally featureless, aside from agreeing 2-4, which have a GENDER probe (this leaves open the issue of how to deal with the default case alternation).

\(^{10}\) Willim (2015) raises the issue of how these numerals can left branch extract if they are heads.
Finnish (2+): Again, taking these numerals to be Q heads, they lack NUMBER, and are therefore featureless (Finnish does not have GENDER). The structure is the same as for Polish.

(76)  
\[
\begin{array}{c}
DP \\
D \\
QP \\
2+ \\
#P/\sqrt{P} \\
\text{SG} \\
\sqrt{P} \\
\gamma \\
\end{array}
\]

This concludes the structural discussion; we turn now to patterns of case, for which numerals in Polish and Finnish show highly idiosyncratic patterns.

4 \hspace{1cm} \textbf{More on quantifying elements: Case}

4.1 \hspace{1cm} \textbf{A correlation of case and concord}

There is a correlation between the presence of features (NUMBER or GENDER) and patterns of case, which have been visible in many of the examples we’ve discussed so far, but which I have not explicitly highlighted:

(77) In structural case environments, when the numeral agrees with the noun for some phi-feature (NUMBER or GENDER), it also matches in case.

Examples:

In Finnish, the numeral triggers partitive case, \textbf{unless it agrees with the noun} (Brattico 2011).

(78) [Kaksi mies-tä] nukkui.  
\begin{align*}
\text{Two} & \text{-SG.PRT} \\
\text{men} & \text{-3SG} \\
\text{Slept.3SG} \\
\text{‘Two men slept.’ (Brattico 2011: 1042, ex. 1)}
\end{align*}

(79) Kahdet paperit  
\begin{align*}
\text{Two.PL} & \text{ papers.PL} \\
\text{‘Two sets of papers’ (Hurford 2003: 35)}
\end{align*}

(80) Minulla on vain yhdet simälasit.  
\begin{align*}
\text{1SG.ADESS} & \text{ be.3SG only one.PL.NOM} \\
\text{glasses.PL.NOM} \\
\text{‘I have only one pair of glasses’ (Sakuma 2008, ex. 7)}
\end{align*}

In Serbian, certain quantifiers trigger genitive case and default verbal agreement, \textbf{unless they agree with the noun} (Hartmann and Milićević 2009).
Mnogi ljudi su bili u ovoj galeriji juče u 6.
‘Various people were at the gallery yesterday at six o’clock.’

Mnogo ljudi su bili u ovoj galeriji juče u 6.
‘Many people were at the gallery yesterday at six o’clock.’

Veselinovač (2016) presents Serbo-Croatian numerals 2-4 as marking the noun nominative plural if feminine, but genitive singular if masculine or neuter.

ove dvije stare grâne/*grâně
this.F.PL.NOM two.F old.F.PL.NOM branch.F.PL.NOM/SG.GEN
‘these two old branches’

ova dva ruzinava broda
this.N.PL.NOM two rusty.N.PL.NOM ship.M.SG.GEN
‘these two rusty ships’

She analyzes the numerals as have an unvalued GENDER feature, which is only capable of agreeing with feminine nouns, taking default GENDER otherwise. Here, the correlation is that the numeral triggers genitive, unless it has successfully agreed.

As a final example, in Polish, numerals 2-4 have two patterns with virile nouns, one agreeing and nominative, the other caseless, with default forms.

Dwaj / trzej / czterej chłopcy spali.
Two.V.NOM / three.V.NOM / four.V.NOM boys.M.NOM slept.V.PL
‘Two / three / four boys slept.’

Dwóch / trzech / czterech chłopców spało.
Two.GEN / three.GEN / four.GEN boys.GEN slept.N.SG(DEF)
‘Two / three / four boys slept.’

These numerals were taken to differ only with regards to agreeing GENDER; thus, the numeral triggers a caseless pattern, unless it agrees for GENDER.

Brattico (2011: 1046) recognizes this correlation in various Slavic and Finno-Ugric languages, noting that “what is impossible is for the Q-numeral to both govern [case] and agree.”

Hartmann and Milićević (2009 ex. 20) provide the following generalization, based on Serbian:

(i) When the noun and the quantifier agree in phi-features within the noun phrase (or QP), they also agree in case, and the full noun phrase agrees with the verb (in subject position).

(ii) When the noun and quantifier do not agree in phi-features, the noun inside QP appears in genitive.

Why does this generalization hold? I propose that it relates to the featurelessness of the numeral, in combination with the case assigning mechanism. Let us look at this in more detail.
4.2 Case Assignment Mechanism

Contra Chomsky (2000, 2001), I do not assume that case is a by-product of agreement; I treat case as a phenomenon separate from agreement.

The motivation for this is the mismatch between case and agreement found in certain languages, including English, as well as ergative languages which allow agreement with ergative subjects (e.g., Nepali, see Bobaljik 2008).

In English, for example, quantifying nouns require the quantified noun to occur in an of-phrase. This does not affect verbal agreement with the noun.

(88) A bunch *(of) people
(89) A bunch of people were / *was sleeping.

Instead, I adopt the dependent case mechanism, developed in Marantz (1991), McFadden (2004), Preminger (2011), and Baker (2015), among others.

- Dependent case morphologically distinguishes nouns within a single domain, marking one of the two nouns with “dependent case.”
- In the clausal domain, we get something like:

(90) a. Transitive (ACC) b. Transitive (ERG) c. Intransitive (ACC/ERG)

Following Baker (2015), I assume that dependent case also applies in the DP domain; DP dependent case seems to be genitive for Slavic, and possibly partitive for Finnish.

(91) DP → Cased in the external environment

... 

DP → genitive (Slavic) / partitive (Finnish)

Question: Dependent case is usually discussed with regards to the noun – how do adjectives, demonstratives, etc., get assigned case under a dependent case system (assuming case is not necessarily a feature)?

Proposal:
- Polish and Finnish are concord languages, meaning everything in the nominal domain usually shows phi- and case agreement with the noun.
- Suppose DP-internal phi-agreement is actually feature sharing (Frampton and Gutmann 2000; Danon 2011).
Dependent case assignment is calculated on the basis of feature sets. Case assignment to a feature set assigns that case to all terminals which share those features.

Under this hypothesis, it is the distribution of features in the DP which determines case assignment, and not necessarily DP boundaries. As a result, case can target non-maximal projections (a necessary result for numeral constructions).

4.3 Case assignment in numeral constructions

Using the structures developed previously for the numerals, let us examine the agreement relations, and the case patterns we (expect to) find.

4.3.1 Numeral 1 in Finnish and Polish

Numeral 1: Adjective which agrees in NUMBER, GENDER (Polish), and CASE

The numeral joins the feature set of the noun through feature sharing. Thus, it joins the case assignment domain of the noun; we expect it to always match in case with the noun.
4.3.2 Numeral 1000 in Polish

- Numeral 1000: Noun with NUMBER and optionally GENDER; N2 surfaces genitive.

Numeral 1000 involves two feature sets – the feature set of the noun (#, γ) and the feature set of the numeral (#, (γ)); this creates two case assignment domains.

Genitive being the dependent case in Polish, we expect the noun to surface as genitive; because the numeral always has NUMBER, it will consistently form a domain independent of the noun.

Anything which agrees with the numeral will be cased with the numeral, and anything which agrees with the noun will be cased with the noun as genitive. For example, this gives us our pattern of discontinuous agreement with numeral 1000:

(95) Całych tysiąc ptaków
Whole.GEN thousand birds.GEN
'A whole thousand birds'

4.3.3 Agreeing numerals 2–4 in Polish

- Numerals 2-4: Numberless, but agree for GENDER and CASE

Numerals 2-4 join the case assignment domain of the noun through agreement:
Because the numeral has joined the feature set of the noun, we predict it to always match in case with the numeral, as is true.

4.3.4 Non-agreeing numerals 2-4 and 5+ (Polish) and 2+ (Finnish)

- Numerals 2-4 (Pol), 5+ (Pol) and 2+ (Fin): Numberless (Pol/Fin), with unclear relation to GENDER (Pol); noun surfaces genitive/partitive.

We seem to have only a single case domain, given that there is only one feature set:

(97)
```
DP
  D
  QP
  Card
  #P
  SG/PL √P
  [#,γ] γ √
```

But, we know that these numerals trigger genitive/partitive on the noun, which would suggest that the numeral noun construction undergoes dependent case assignment. Where is the second element?

I propose that the case mechanism, in fact, considers all elements in the DP including the numeral, but it can only assign case to feature sets. Thus, the numeral is included in the case calculation, triggering genitive/partitive, but it cannot receive case (and is therefore default).

(98)
```
DP
caseless
  D
  QP
  Card
  #P
  SG/PL √P
  [#,γ] γ √
```

The structure of the DP might lead us to think that the verb should be able to reach and agree with the noun; however, I suggest that by marking the noun as genitive, it and its features essentially become inaccessible to external probes.

→ Thus, we predict to for verbal agreement to always be default.

Remaining Issue (Polish): Elements higher than the numeral which agree in Polish can take either a (gender-determined) default form, in “agreement” with the numeral, or a genitive form, in agreement with the noun.
The issue is how to model agreement with the numeral, if it has no features to trigger agreement. Furthermore, because the default form is sensitive to $\gamma$, much like the default of the numeral, it is still a question of how this should be modeled.

5 Loose ends: Case in Germanic

English $of$ is fairly good candidate for genitive case, as it appears in binominal constructions:

```
(101) The source of the problem
(102) A heap of apples
(103) The mother of my son
```

If dependent case is also active in English, we would expect that it is the source of $of$.

In constructions involving quantifying nouns, $of$ is obligatory:

```
(104) A bunch / number / ton / lot *(of) people
```

Based on our derivations for Polish and Finnish, we might analyze this as follows:

- The quantifying noun itself is featureless (despite singular $a$) – this seems to be generally true, as the quantifying noun cannot always inflect for plural:

```
(105) *Bunches / Numbers of people
```

- Dependent case includes both the quantifying noun and the quantified noun in the case calculation; since they do not agree with each other, they are cased differently.
- The quantified noun is cased as genitive ($of$) and the quantifying noun remains caseless

Prediction: Because the quantified noun is marked genitive and the quantifying noun has no features, verbal agreement should be default.

$\rightarrow$ False! Verbal agreement targets the “genitive” noun:

```
(106) A bunch / number / ton / lot of people were / *was sleeping.
```

Question: How can the verb still access the quantified noun after it has been cased as genitive?

Answer: $Of$ does not seem to represent the same kind of genitive as in Polish.

If we look at quantifying nouns in Dutch, we find that despite Dutch having a “genitive” preposition $van$, it does not use it in the Dutch equivalent of the English construction.
It does not seem to be the case that the Q-noun is agreeing with the quantified noun here, and thus, dependent case assignment does not seem to apply at all in this construction, despite presumably applying elsewhere.

Conclusion: It is likely that systems of case assignment differ between languages, especially between languages which strongly express morphological case (Slavic, Finno-Ugric, with exceptions), and languages which are mostly reduced to a system of prepositions to express case meanings (Germanic, with exceptions). But it is not clear to me yet how to understand the distribution of these “genitive” of and van in English and Dutch.

6 Conclusions

7 References


