1. Introduction

The observation that certain quantificational expressions are noun-like has been repeated in the literature, with many analyses equating them with nouns:

- Numerals as nouns (Jackendoff 1977; Corbett 1978; Zabbal 2005; Corver & Zwarts 2006; Ionin & Matushansky 2006; Stavrou & Terzi 2008)
- Pseudopartitives as involving nouns or semi-lexical heads (Jackendoff 1977; Selkirk 1977; Abney 1987; van Riemsdijk 1998)

Glancing at Polish and English, we can immediately see the reason for this:

(1) Pięć ptaków
    Five birds

(2) Tysiąc ptaków
    Thousand birds

(3) Klucz ptaków
    Key birds

(4) A bunch of books
    English pseudopartitives

(5) A lot of books

(6) A dozen books

This talk is concerned with the question of category, and why nominal properties arise with certain quantificational expressions. I present two case studies: Polish numerals 1000 and 5, and English quantificational nouns (Q-nouns) *lot*, *ton*, and *bunch*.

2. Basic DP structure (assumptions)

Drawing on exoskeletal approaches to DP structure (Borer 2005, de Belder 2011, a.o.), I assume minimally the following set of projections in the DP:

- **DP**: Definiteness phrase (Abney 1987), or determiner phrase (Lyons 1999)
• **QP**: Quantifier phrase (e.g. Löbel 1989; Giusti 1991; a.o.)
• **#P**: Number phrase (Ritter 1991, 1992; a.o.)
• **γP**: Gender phrase (Picallo 1991; superficially similar to Lowenstamm 2008)
• **Root**: the lexical root

Not all projections need be present in all structures, e.g. if no quantity is expressed, QP may be absent (and likewise, with a mass noun, #P may be absent).

English can express definiteness (indefinite, definite), quantity, and number:

(7) Structure of an English DP:

![Diagram of English DP structure]

Polish can express quantity, number, and gender, motivating QP, #P, and γP. Demonstratives can occur, and are situated in the left edge of the nominal expression, suggesting some higher region for referentiality, which I encode here as DP.

(8) Structure of a Polish DP:

![Diagram of Polish DP structure]

3. **Case study #1: Polish numerals 5 and 1000**

Polish cardinal numerals can be divided into four classes, according to their morphosyntactic properties, and the categories they resemble:

- Numeral 1 (adjective)
- Numerals 2, 3, 4 (adjective-like and noun-like)
- Numerals 5-10, 100 (adjective-like and noun-like)
- Numeral 1000 (noun-like)

I focus on the last two numeral types: numeral 1000 and numerals 5-10, 100.
3.1 Numeral 1000

3.1.1 Morphosyntactic properties of numeral 1000

**Paradigm:** Numeral 1000 resembles a lexical noun in its morphological paradigm (compared here to a similar-sounding noun *miesiąc* ‘month’):

(9) Table 1: Paradigm of 1000 and lexical noun *miesiąc* ‘month’

<table>
<thead>
<tr>
<th></th>
<th>SG</th>
<th>PL</th>
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</thead>
<tbody>
<tr>
<td>NOM</td>
<td>tysiąc</td>
<td>tysiąc-e</td>
</tr>
<tr>
<td></td>
<td>miesiąc</td>
<td>miesiąc-e</td>
</tr>
<tr>
<td>ACC</td>
<td>tysiąc-a</td>
<td>tysiąc-y</td>
</tr>
<tr>
<td></td>
<td>miesiąc-a</td>
<td>miesiąc-y</td>
</tr>
<tr>
<td>GEN</td>
<td>tysiąc-owi</td>
<td>tysiąc-om</td>
</tr>
<tr>
<td></td>
<td>miesiąc-owi</td>
<td>miesiąc-om</td>
</tr>
<tr>
<td>DAT</td>
<td>tysiąc-u</td>
<td>tysiąc-ach</td>
</tr>
<tr>
<td></td>
<td>miesiąc-u</td>
<td>miesiąc-ach</td>
</tr>
<tr>
<td>LOC</td>
<td>tysiąc-em</td>
<td>tysiąc-ami</td>
</tr>
<tr>
<td></td>
<td>miesiąc-em</td>
<td>miesiąc-ami</td>
</tr>
</tbody>
</table>

**Case Assignment:** It also resembles a lexical noun in requiring genitive on the quantified noun in all case contexts (compared here to *klucz* ‘flock (lit. key)’):

(10) Tysiąć ptaków / Klucz ptaków
    Thousand.NOM birds.Gen / Key.NOM birds.Gen
    ‘A thousand birds / A flock of birds (flying in a V)’

(11) Z [tysiącem ptaków / kluczem ptaków]
    ‘With a thousand birds / a flock of birds (flying in a V)’

**Agreement:** Where it differs concerns agreement patterns. With a lexical noun, the verb (in the past tense) agrees for person, number, and gender.

(12) Chłopcy spali i dziewczyny spały.
    Boys.M.Pl.NOM slept.3.V.Pl and girls.F.Pl.NOM slept.3.NV.Pl
    ‘The boys slept, and the girls slept.’

I report on numeral 1000. The results below are gathered from the Polish National Corpus (using the balanced NKJP subcorpus of 300m words) (Przepiórkowski et al. 2011), and were tested against the grammaticality judgments of five native speakers.

- When numeral 1000 is **bare** and **singular**, verbal agreement is **default** (n=5):¹

¹ The following searches were conducted in the 300m word corpus.

- i. Default agreement: [pos=adj] tysiąc [pos=adj] [pos=verb & number=sg & gender=m3]
- ii. Agreement: [pos=adj] tysiąc [pos=adj] [pos=verb & number=sg & gender=n]

There were 88 default agreement hits (most unverified), and 7 agreement hits (verified not to be genuine).
(13) Przez ciebie **tysiąc** kijów spadło na mój grzbiet!
By you thousand sticks,GEN fell,NSG on my back
‘Because of you, a thousand sticks fell on my back!’

(14) **Wokół** niego **tysiąc** **gwiazd** migotało na niebie …
Around him thousand stars,GEN flickered,NSG on heavens
‘Around him, a thousand stars flickered in the heavens…’

- When 1000 is **bare** and **plural**, verbal agreement is **default** or **successful**; if successful, it targets the numeral (n=1 of 1):²

(15) **Tysiące** pytań **przychodziło/przychodziły** mi do głowy.
Thousands questions,GEN came,NSG /came,NV,PL me to head
‘Thousands of questions came to my head.’

- If numeral 1000 is preceded by an **agreeing pre-modifier** (adjective, demonstrative), verbal agreement is **successful** (targets the numeral), and if it is preceded by a non-**agreeing pre-modifier**, verbal agreement is **default** (n=5):³

Agreeing pre-modifier and verb:
(16) …i **dobry** **tysiąc** kamieni **przemknął** nam
and good,MSG thousand,NOM rocks,GEN flew,MSG us
over necks
‘and a good thousand rocks flew over our heads (lit. necks).’

(17) **Do** Albanii **dotarł** **pierwszy** **tysiąc** żołnierzy
To Albania reached,MSG first,MSG thousand,NOM soldiers,GEN
sił międzynarodowych.
‘The first thousand soldiers from the international forces reached Albania.’

(18) **Ponieważ** **ten** **tysiąc** zawierał prawie całą
Because DEM,MSG thousand,NOM contained,MSG almost all,ACC
śmietankę polskiego towarzystwa…
cream,ACC Polish,GEN society,GEN
‘Because this thousand contained almost all the cream of Polish society’

**Note:** The set of pre-modifiers which can agree with the numeral is subject to speaker variation; more research is needed on this.

² The following searches were conducted in the 300m word corpus:
 i. Agreeing verbs: [base=tysiąc & number = pl & case=nom] [pos=verb & number=pl] (103 hits, unverified)
 ii. Non-agreeing verbs: [base=tysiąc & number = pl & case=nom] [pos=verb & number=sing] (190 hits, unverified)

³ The following searches were conducted in the 300m word corpus:
 i. Agreeing premodifiers: [pos=adj & gender=m3 & number=sg] tysiąc (187 hits, unverified)
 ii. Non-agreeing premodifiers: [pos=adj & gender=m3 & number=pl] tysiąc (33 hits, unverified)
Non-agreeing pre-modifier and verb:

(19) Te tysiąc złotych przeznaczone było na DEM.NV.PL thousand.NOM gold.GEN designed.NV.PL was.N.SG for jakiś cel i już zostało wydane.

some purpose and already was.N.SG spent.NV.PL

‘These thousand gold(Polish currency) were designed for some purpose and have already been spent.’

• Verbal agreement cannot be default if the pre-modifier agrees (n=4, of 5):

(20) %Dodatkowy tysiąc osób dał-o-by się Additional.M.SG thousand people.PL allow-N.SG(COND) SIE upchnąć w prywatnych pensjonatach.
push.INF in private.LOC pensions.LOC

‘An additional one thousand people would allow themselves to be pushed into private pensions.’

• Verbal agreement cannot be successful if the pre-modifier does not agree (n=5):

(21) *Dodatkowe tysiąc osób dał-by się Additional.NV.PL(DEF) thousand people.PL allow.M.SG(COND) SIE upchnąć w prywatnych pensjonatach.
push.INF in private.LOC pensions.LOC

• Pre-modifiers can agree with the quantified noun, with default verb agreement (n=5):

(22) Kolejnych tysiąc osób przyszło osobiście albo zadzwoniło. Another.GEN thousand people.GEN came.N.SG in.person or called.N.SG

‘Another thousand people came in person or called.’

(23) Że tych tysiąc górników od razu poszło się...

that DEM.GEN thousand miners.GEN at once went.N.SGSIE

‘...that a thousand miners went at once (to...)’

AGREEMENT SUMMARY: We have two patterns: either everything agrees with the numeral for masculine singular (Pattern 1), or nothing agrees with the numeral, targeting the quantified noun or surfacing with default morphology (Pattern 2).


AGREEING

‘A whole thousand birds slept.’ (= (15)-(18))

---

4 The search was expanded to the 1800m word corpus, given that no relevant examples surfaced in the 300m word corpus. The search was the following:

i. [pos=adj & gender=m3 & number=sg] tysiąc [pos=subst] [pos=praet] (1 genuine hit)

5 The search was also expanded to the 1800m word corpus. The search was the following:

i. [pos=adj & number=pl] tysiąc [pos=subst] [pos=praet] (0 genuine hits)
3.1.2 Two numeral 1000s

Hypothesis: The two agreement patterns correspond to two different numeral 1000s.

Further evidence: Distributive marker po and verbal agreement

• Distributive marker po requires locative case on lexical nouns (see Przepiórkowski 2010, 2013, Przepiórkowski and Patujek 2013):

(26) Dałam im po jabłku / *jabłko
Gave.1SG.F them DIST apple.LOC/*apple.ACC
‘I gave them an apple each.’

“Numerals” take the case of the case context with po (here accusative):

(27) Dałam im po pięć jabłek / *pięciu jabłkach.
Gave.1SG.F them.DAT PO five.ACC apples.GEN / five.LOC apples.LOC
‘I gave them five apples each.’

Numeral 1000 shows optionality – it either surfaces as locative like a lexical noun, or in the case of the case context like a numeral:

(28) Dałam im po tysiąc / tysiącu jabłek.
Gave.1SG.F them DIST thousand.ACC / thousand.LOC apples.GEN
‘I gave them a thousand apples each.’

• Conjoined verbs should not show two agreement patterns with one numeral 1000. This is true:

(29) a. *Cale tysiąc ptaków jadł i spało.
Whole.DEF thousand birds.GEN ate.M.SG and slept.N.SG
‘A whole thousand birds ate and slept.

30 a. *Cały tysiąc ptaków spało i jadł.
Whole.M.SG.NOM thousand birds.GEN ate.M.SG and slept.N.SG
‘A whole thousand birds ate and slept.’

b. *Cały tysiąc ptaków spało i jadł.
Pattern 1 (full agreement):

(31) Całtystysięc ptaków spał.  
Whole.M.SG thousand birds. GEN slept.M.SG  
‘A whole thousand birds slept.’  
AGREEING  
(= (15)-(18))

The numeral has phi-features, both # (SG or PL) and \( \gamma \) (MASCULINE, INANIMATE). These act as an intervener for agreement, thereby leading to the numeral controlling both the modifier and verb.

(32) \[ TP \ [DP \ldots \ ADJ \ldots 1000 \ldots N_{GEN}] [\gamma, \#] [\gamma, \#]_{GEN} [\gamma, \#] \]

Pattern 2 (default agreement):

(33) a. (Całe) tysiąc ptaków spało.  
Whole.NV.PL thousand birds. GEN slept.N.SG  
‘A (whole) thousand birds slept.’  
DEFAULT  
(= (13)-(15), (19))

b. (Całych) tysiąc ptaków spało.  
Whole.GEN thousand birds. GEN slept.N.SG  
‘A (whole) thousand birds slept.’  
(= (22)-(23))

The numeral is phi-feature deficient. It carries number (SG or PL), but no \( \gamma \). Because the noun is also genitive, there is no target for successful verbal agreement; the pre-modifier can target the noun (genitive) or numeral (default).

(34) \[ TP \ [DP \ldots \ ADJ \ldots 1000 \ldots N_{GEN}] [\gamma, \#] [\gamma, \#]_{GEN} [\gamma, \#] \]

3.1.3 Numeral 1000 has the structure of a noun

The agreement patterns derive from the phi-feature specifications, numeral 1000 with # and \( \gamma \), or only #. This suggests a structural representation which includes \#P and \( \gamma P \):

(35)  
\[ \#P \]  
\[ \#_{SG,PL} (\gamma P) \]  
\[ (\gamma_{M[A]I}) \]  
\[ \sqrt{P} \]  
\[ \sqrt{1000_Q} \ldots \]

Numeral 1000 is noun-like in carrying phi-features.

The ability to combine with other numerals and quantifiers also suggests it has a QP:
Dwa tysiące ptaków (compare: dwa ptaki)
Two.M.NOM thousands.NOM birds.GEN two.M birds.GEN
‘Two thousand birds’ ‘two birds’

Pięć tysięcy ptaków (compare: pięć ptaków)
Five.NOM thousands.GEN birds.GEN five birds.GEN
‘Five thousand birds’ ‘five birds’

Kilka / wiele / ile tysięcy ptaków
Several / many / how many thousands.GEN birds.GEN
‘Several thousand birds / (how) many thousands of birds’

If this is a true QP, we **predict** that adjectives can surface between quantifiers of the numeral and the numeral. This is true (corpus examples verified):

Tych kilkanaście niedznych tysięcy dolarów
DEM.PL.GEN tens(11-19) miserable.PL.GEN thousands.GEN dollars.GEN
ustawiało ich finansowo …
set.up.N.SG them financially …
‘Those miserable several / many thousands of dollars ($11,000-$19,000) set them up financially.’

Kilka kolejnych tysięcy świętowała udział
Several.NOM next.NV.PL.GEN thousands.GEN celebrated.N.SG participation
ich faworytów w finale na ulicach hiszpańskiego miasta.
their favorites in final on streets Spanish city
‘The next several thousand celebrated the participation of their favorites in the final on the streets of a Spanish city.’

Gdyby panu, nie daj Bóg, coś się stało,
If you NEG give.IMP God something SIE happened.N.SG
to z 
trzydziestoma dodatkowymi tysiącami …
DEM.N.SG with[INST] thirty.INST additional.INST thousands.INST
‘If God forbid anything happened to your additional thirty thousand’

The structural representation for numeral 1000 also includes a QP, the host of other quantifiers and numerals:

\[
\text{QP}
\text{Q}
\text{#P}
\text{AdjP}
\text{#'}
\text{#sg,pl}
\text{(yP)}
\text{(ym[0])}
\text{√P}
\text{√1000Q}
\text{…}
\]

**In sum**, numeral 1000 has more or less the structure of a lexical noun in Polish, with yP absent in some cases. Its similarity to nouns can be traced to its near-structural identity to lexical nouns, where deviations produce non-lexical results (e.g. Pattern 2 agreement).
3.2 Numerals 5-10 and 100

3.2.1 Morphosyntactic properties of numerals 5-10 and 100

**PARADIGM:** These numerals have a reduced paradigm compared to nouns or adjectives.

(43) Table 2: Paradigm of numerals 5-10 and 100

<table>
<thead>
<tr>
<th></th>
<th>NON-VIRILE</th>
<th>VIRILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOM</td>
<td>-Ø</td>
<td></td>
</tr>
<tr>
<td>ACC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEN</td>
<td>-u⁶</td>
<td></td>
</tr>
<tr>
<td>LOC</td>
<td>-oma, -u</td>
<td></td>
</tr>
<tr>
<td>DAT</td>
<td></td>
<td></td>
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<tr>
<td>INST</td>
<td></td>
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</tr>
</tbody>
</table>

(44) 5: pięć, pięci-u, pięci-oma / pięci-u  
10: dziesięć, dziesięci-u, dziesięci-oma / dziesięci-u  
100: sto, st-u, st-oma / st-u

**CASE ASSIGNMENT:** Like lexical nouns, they require genitive case on the quantified noun, but only in non-oblique case contexts (nominative, accusative):

(45) *Non-oblique case context (nom, acc):*

a. Pięć ptaków spało.  
   Five NOM birds GEN slept N.SG  
   ‘Five birds slept.’

b. Student fizyki spał.  
   Student NOM physics F.SG GEN slept M.SG  
   ‘The student of physics slept.’

(46) *Oblique case context (dat, loc, instr, gen?):*

a. Z pięcioma studentami  
   with INST five INST students INST  
   ‘with five students’

b. Ze studentem fizyki /*fizyką  
   with INST student INST physics GEN /*physics INST  
   ‘with a student of physics’

**AGREEMENT:** Verbal agreement is obligatorily default.

(47) Pięć ptaków spało.  
   Five NOM birds GEN slept N.SG  
   ‘Five birds slept.’

---

6 While syncretic with some case-number-gender portmanteaux’s in modern-day Polish, the –u suffix is historically borrowed from the genitive dual suffix for nominals (Dziubala-Szrejbrowska 2014: 93), and is therefore presumably independent of them.
Pre-modifiers and predicative adjectives can surface either as genitive (in agreement with the noun) or in a default form (= morphologically, the non-virile plural):

(48) a. Te tych pięć ptaków
   DEM.NV.PL.NOM / DEM.GEN five NOM birds GEN
   ‘Those five birds’
b. Pięć ptaków zostało zjedzone zjedzonych.
   Five NOM birds GEN were N.SG eaten NV.PL.NOM / eaten PL GEN
   ‘Five birds were eaten.’

This is exactly Pattern 2 as found for numeral 1000. There are, however, important differences between numerals 5 and 1000.

**Difference #1:** Numeral 1000 has a singular-plural distinction, which numerals 5-10 and 100 do not. This suggests they cannot carry # in the same way.

**Difference #2:** Numerals 5-10 and 100 are sensitive to the gender of the quantified noun, while numeral 1000 is not. These gender values are relevant only for the plural (masc. pl. subgenders = VIRILE, NON-VIRILE; masc. sg. subgenders = ANIMATE, INANIMATE).

(49) Pięciu chłopców, pięć dziewczyn
    Five.V boys.GEN, five.NV girls.GEN
    ‘Five boys, five girls’

(50) Tysiąc chłopców / dziewczyn spalo.
    Thousand.NOM boys.GEN / girls.GEN slept N.SG
    ‘A thousand boys / girls slept.’

3.2.2 **Numerals 5-10 and 100 do not have the structure of lexical nouns**

- Numerals 5-10 and 100 do not have a γP: they match the γ of the quantified noun.
- Numerals 5-10 and 100 do not have a #P: they cannot express singular/plural.
- Numerals 5-10 and 100 cannot be quantified by a QP.  

(51) *Trzy / trzech pięć(-u)
    Three.NOM/ACC / three.OBL five(-OBL)

(52) *Wiele / wielu pięć(-u)
    Many.NOM/ACC / many.OBL five(-OBL)

(53) *Pięć stu (must be: pięćset)
    Five hundred.GEN

These are phi-featureless numerals, and do not have a nominal syntax.

See the appendix for an analysis of the syntax of these numerals.

---

7 Quantities like 200, 300, …, 900 can be expressed, but the morphology seems to be frozen, and not productive. For example, 200 in the nominative is *dwieści, dwie* historically being the neuter form of 2 (the modern-day feminine form), and *ścice* being the dual form of 100 (which had neuter gender). Similarly, 500 in the nominative is expressed as *pięćset*, where *-set* was the genitive plural form. The synchronic genitive plural form is *stu*.
3.3 From N to Q: The development of 5 and 1000

In older stages of Polish, numeral 5 had the syntax of a noun, like numeral 1000 today.

It functioned as an *i*-stem noun, triggering feminine singular verbal agreement (Rutkowski 2007, Miechowicz-Mathiasen 2012, Dziubała-Szrejbrowska 2014):

(54) Pięć lat minęła. (Old Polish)

Five.F.SG years.GEN passed.F.SG

‘Five years passed.’

(55) Jako minęła dziesięć lat

As passed.F.SG ten.F.SG years.GEN

‘As ten years passed.’ (Dziubała-Szrejbrowska 2014: 103, ex. 132)

⇒ This suggests a γP, feminine for numeral 5.

Miechowicz-Mathiasen (2012: fn. 13) also reports a plural form for numerals 5-9, though extremely rare. More common was a plural form for 10:

(56) Z piąć-ą dziesięć synów (15th-16th cent. Polish)

With[INST] five-SG.INST-ten.GEN.PL sons.GEN

‘With fifty sons’ (Miechowicz-Mathiasen 2012: 7, ex. 1b)

⇒ This suggests a #P, which could realize singular or plural.

⇒ The ability to be quantified by another numeral also suggests a QP.

In oblique case contexts, the noun remained genitive:

(57) Z piąćią synów (15th-16th cent. Polish)

with[INST] five-SG.INST sons.GEN

‘with five sons’ (Miechowicz-Mathiasen 2012: 7, ex. 1a)

• This is a property numeral 5 has lost, which numeral 1000 retains.

Conclusion: Historic numeral 5 shared many properties with modern numeral 1000 (gender, number, case assignment, agreement), and may have similarly had the syntax of a lexical noun, suggesting numeral 5 has moved from N to Q.

Modern numeral 1000 seems to be transitioning towards the syntax of numeral 5 (p.c. Ewa Willim):

• It varies between showing agreement (= like a lexical noun, Pattern 1) and non-agreement (= like numeral 5, Pattern 2).

• While most speakers need a genitive on the quantified noun in all case contexts (= like a lexical noun), this is changing. Some speakers allow oblique case on the quantified noun (like numeral 5):
In the 1800m word corpus, there are 15 hits with INSTRUMENTAL on the quantified noun, 17 hits with DATIVE, and 139 hits with LOCATIVE (unverified hits).

Together, this suggests a grammaticalization cline, which 1000 is participating in:

\[
\text{(59) Noun} > \text{Deficient noun} > \text{Numeral} \\
[#, γ] >[#] >[]
\]

**Conclusion:** Numeral 1000 is in the process of moving from N to Q.

4. **Case study #2: English quantificational nouns (Q-nouns)**

Three lexical items of interest: *lot(s), ton(s), bunch*

\[
\text{(60) A lot / lots of books} \\
\text{(61) A ton / tons of books} \\
\text{(62) A bunch of books}
\]

Each of these appears to indicate something along the lines of “many”, but their degree of “many-ness” differs:

\[
\text{(63) \text{ton} \text{ is more than} \text{lot} \text{ is more than} \text{bunch}}
\]

**Degree of many-ness**

4.1 **Quantifying expressions in English**

**Hypothesis:** Pseudopartitive quantifying nouns like *lot, ton, bunch* are not different from other quantifying expressions like numerals and quantifiers. Apparent differences are at a surface level (possibly related to the level of grammaticalization).

English numerals/quantifiers surface bare or with an article when indicating quantity:

\[
\text{(64) Many books, three books} \\
\text{(65) A few books, a hundred books, a dozen books}
\]

Q-noun pseudopartitives share this quantifying function, but need both an article and *of*:

\[
\text{(66) A lot of books, a ton of books, a bunch of books, (lots of books, tons of books)}
\]

Despite the *of*, Q-nouns seem to quantify in the same way as numerals / quantifiers. Selkirk (1977: 307-308), for example, shows Q-nouns to differ from partitives, using the “daffodil test.” Partitives are ambiguous, pseudopartitives not:

\[
\text{(67) She bought him a lot of daffodils, only two of which were faded.}
\]
One reading: The faded daffodils fall in the set of purchased daffodils

(68) She bought him a lot of those daffodils, only two of which were faded. **Two readings:** (a) The faded daffodils fall in the set of purchased daffodils (= the part), or (b) the faded daffodils fall in the whole set of daffodils (compatible with a scenario in which no faded daffodils were purchased) (= the whole)

Numerals and quantifiers also mirror this pseudopartitive / partitive distinction:

(69) She bought him many / some / three / a few / a dozen / a hundred daffodils, only two of which were faded. **(one reading)**

(70) She bought him many / some / three / a few / a dozen / a hundred of those daffodils, only two of which were faded. **(two readings)**

(71) #She bought three daffodils, seven of which were faded.

(72) She bought three of those daffodils, seven of which were faded.

Treating these all as quantifiers, English encodes this type of quantification in the following ways:

(73) Morphological expression of the quantifying function:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>lot / ton / bunch / number</td>
<td>of</td>
<td>books</td>
</tr>
<tr>
<td>a</td>
<td>few / hundred / dozen</td>
<td>books</td>
<td></td>
</tr>
<tr>
<td></td>
<td>many / some / three</td>
<td>books</td>
<td></td>
</tr>
</tbody>
</table>

**Goals:** Identify the source of the article and the particle in pseudopartitives. This will have consequences for the analysis of the other types of expressions (the bottom two rows), which I hope to explore in future work.

4.2 The basic structure of a pseudopartitive

4.2.1 One extended projection

**Hypothesis:** Despite the *of*, the Q-noun and quantified noun belong to the same extended projection.

**Extraposition:** Selkirk (1977: 309, ex. 86) and others show Q-nouns to differ from lexical nouns in binominal constructions with regards to extraposition:

(74) Lexical example: *A review*

a. A review of answers to your argument was given.

b. A review was given of answers to your argument.

c. *A review of answers was given to your argument.*

Q-nouns permit extraposition of N3 (different from lexical nouns!), but not an N4:

(75) *A lot / Lots*
a. A lot\textsubscript{N1} / Lots\textsubscript{N1} of answers\textsubscript{N2} to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}) were given.
b. *A lot\textsubscript{N1} / Lots\textsubscript{N1} were given of answers\textsubscript{N2} to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}).
c. A lot\textsubscript{N1} / Lots\textsubscript{N1} of answers\textsubscript{N2} were given to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}).
d. *A lot\textsubscript{N1} / Lots\textsubscript{N1} of answers\textsubscript{N2} to your argument\textsubscript{N3} were given against stoicism\textsubscript{N4}.

(76) A ton / Tons
a. A ton\textsubscript{N1} / tons\textsubscript{N1} of answers\textsubscript{N2} to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}) were given.
b. *A ton\textsubscript{N1} / tons\textsubscript{N1} were given of answers\textsubscript{N2} to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}).
c. A ton\textsubscript{N1} / tons\textsubscript{N1} of answers\textsubscript{N2} were given to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}).
d. *A ton\textsubscript{N1} / tons\textsubscript{N1} of answers\textsubscript{N2} to your argument\textsubscript{N3} were given against stoicism\textsubscript{N4}.

(77) A bunch
a. A bunch\textsubscript{N1} of answers\textsubscript{N2} to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}) were given.
b. *A bunch\textsubscript{N1} were given answers\textsubscript{N2} to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}).
c. A bunch\textsubscript{N1} of answers\textsubscript{N2} were given to your argument\textsubscript{N3} (against stoicism\textsubscript{N4}).
d. *A bunch\textsubscript{N1} of answers\textsubscript{N2} to your argument\textsubscript{N3} were given against stoicism\textsubscript{N4}.

The same holds true of numerals and quantifiers (treating many or three as N1):

(78) Many
a. Many answers to your argument (against stoicism) were given.
b. *Many were given answers to your argument (against stoicism).
c. Many answers were given to your argument (against stoicism).
d. *Many answers to your argument were given against stoicism.

(79) Three
a. Three answers to your argument (against stoicism) were given.
b. *Three were given answers to your argument (against stoicism).
c. Three answers were given to your argument (against stoicism).
d. *Three answers to your argument were given against stoicism.

- The inability to extrapose the of-phrase of the pseudopartitive suggests it does not have the same status as the PP of a lexical noun.
- The replication of the pattern with numerals/quantifiers further suggests that the Q-noun forms a part of the extended projection of the quantified noun.
- Conclusion: Q-nouns are part of the extended projection of the quantified noun, i.e. they occur in the same DP.

4.2.2 Structure of a pseudopartitive

Pseudopartitives in many other languages look similar to the Q-noun pseudopartitives, differing only in the presence of a particle of:

(80) Een hoop mensen \textit{Dutch}
A lot people
‘A lot of people’
For such languages, the Q-noun has been analyzed as the head of a projection in the functional structure of the N2, e.g. QP (Löbel 1989), #P (Grestenberger 2015), ClP/MP (Stavrou 2003), or nP (Hankamer and Mikkelsen 2008).

(81) Juxtaposition construction (pseudopartitives)

```
DP
  D XP (= QP, #P, ClP, MP, nP)
    Q-noun N2
```

Analyses of languages which need a mediating particle like English, often try to place the of in the structure. Stickney (2004, 2009), for example, assumes a meaningless Functional Projection (FP) to host of.

(82) Stickney (2004, 2009)

```
DP
  D MP
    a
      M FP
        bunch
          F NP
            of
```

I adopt a juxtaposition structure, labeling the intermediate projection QP. I take the Q-noun to be a root under QP.

(83) Q-noun pseudopartitive structure

```
DP
  D QP
    Q √P
      √Q-noun N2
```

The assumption of a root comes from the availability of the pseudopartitive construction for numerous lexical nouns, where the meaning of the noun seems to color the interpretation of the quantity.

(84) A wealth of examples = “Many examples, which are rich in nature”

(85) ton >is more than lot > bunch Degree of many-ness
     (derives from the root?)
As a lexical noun, *wealth* is neither count, nor argument-taking; the article and *of* in (84) are a property of the construction:

(86) *A wealth
(87) *Wealth of money

Further examples from the Corpus of Contemporary American English (Davies 2008-)

(88) A flood of memories
(89) A parade of witnesses
(90) A torrent of words
(91) A sea of faces
(92) A flurry of lawsuits
(93) A chorus of boos
(94) A mob of reporters
(95) A cascade of problems

Where/what are the article and the particle *of*?

4.3 **The pieces of the pseudopartitive: The article and the particle**

4.3.1 **The article**

**Hypothesis**: The article is a lexicalization of Q, which surfaces because the Q-noun cannot move to Q to lexicalize it itself (not functional enough yet?).

(96) Q-noun pseudopartitive structure

```
QP
  Q √P
   a √Q-noun N2
```

**Motivation.** The article differs from the usual indefinite article in English, in that it does not indicate singularity. Pseudopartitive subjects trigger agreement with the N2:

(97) Pseudopartitive Q-nouns:
  a. A lot of *people were/*was invited to the party.
  b. A ton of *people were/*was invited to the party.
  c. A bunch of *people were/*was invited to the party.
  d. Lots of *power was/*were needed for their project.
  e. Tons of *power was/*were needed for their project.

This holds true for the article we see in other quantifying expressions, suggesting it may be the same article:
(98) A hundred / a couple people were stalking the dragon.
(99) A few people were fighting in the ballroom.
(100) A dozen eggs were smashed on Paul’s head.

Quantifying expressions which do not normally require an article (many, three, hundreds) in fact require one when modified:

Modified many
(101) A great/good many donkeys have fallen to the butcher’s knife.

Modified lower numerals
(102) A mere eight companies own nearly all of mainstream media journalism. (COCA: USA Today 2007)
(103) A reported 4,000 delegates were among the 10,000 conventioneers gathered in Charlotte, NC, for the six-day confab. (COCA: Jet 1996)
(104) A suffocating 92,000 fans were in the seats for each game at the L.A. Memorial Coliseum. (COCA: Chicago 2005)

Modified plural higher numerals
(105) Bypassing or tampering with power supplier meters is a growing problem, costing an estimated hundreds of billions of dollars worldwide and accounting for 10% to 40% of all energy use in various countries. (COCA: Futurist 2013)

Supposing that such expressions can usually lexicalize Q, the introduction of a modifier blocks this (visualized here as head movement).

(106) Lexicalization of Q with and without modifier

\[
\begin{align*}
\text{a.} & & \text{QP} \\
& & Q \quad \sqrt{P} \\
& & \sqrt{\text{three}} & \ldots \\
\text{b.} & & \text{QP} \\
& & Q \quad a \quad \sqrt{P} \\
& & \sqrt{\text{measly three}} & \ldots
\end{align*}
\]

Proposal: The article is a “dummy” article which is used as a last resort strategy to fill an empty Q-head.

- Lyons (1999): A(n) does not mark indefiniteness, but cardinality. It is a (singular) default cardinality marker when no numeral, quantifier, or plurality occurs.
- Based on the examples above, I take a(n) to be unspecified for number. It is not clear yet whether this can be collapsed with the indefinite article.
- Under this analysis, the use of a default cardinality marker with a Q-noun
indicates the presence of an empty Q (needs to be tested yet for article requiring quantifiers).

- Q-nouns cannot lexicalize Q, hence the required article:

(107) Q-noun pseudopartitive structure

What about apparent plural lots and tons? The use of -s obviates the need for an article:

(108) (*a) lots / tons of people

By the analysis above, -s must sit in Q. As a bound morpheme, it attracts the Q-noun.

(109) Plurality in the pseudopartitive (lots, tons)

4.3.2 Agreement

The Q-noun never controls agreement. This follows from the analysis: Q-nouns surface as a bare root under a QP, and carry no number of their own:

(110) QP

Lacking number, they cannot control agreement or other processes sensitive to number.
4.3.3 The particle of

Proposal: *Of* is a marker of nominality, when multiple nominals are present in a single domain (cf. dependent case, Marantz 1991, Baker 2015, Levin 2015, a.o.). The Q-noun counts as a noun for *of*-insertion (but numerals do not):

(111)  
\[ \text{DP} \rightarrow \text{D} \rightarrow \text{QP} \rightarrow \text{Q} \rightarrow \sqrt{\text{P}} \rightarrow a \rightarrow \sqrt{\text{Q-noun}} \rightarrow \# \rightarrow \sqrt{\text{N2}} \]

Open question: In what way are numerals “less noun-y” than Q-nouns? Are there structural differences under QP?

If *of* is a morphological marker, it explains why Dutch might lack such a particle – it lacks this particular mechanism of marking nominals in a single domain.

(112) *Een hoop (*van) mensen*  
\[ \text{Dutch} \rightarrow \text{A lot (*of) people} \]

4.4 Implications for grammaticalization: From N to Q

Analysis: The article surfaces only when lexicalization of Q is not possible. The particle only surfaces with quantifiers that are “nominal.”

This analysis has two implications for grammaticalization:

Implication #1: The presence or absence of the article may indicate the level of grammaticalization the quantifier has undergone: more grammaticalized quantifiers (numerals, *many*) can lexicalize Q, while less grammaticalized quantifiers (Q-nouns) cannot.

Implication #2: The presence or absence of the particle may indicate the level of grammaticalization, in this case, whether the quantifier is noun-enough to trigger a particle.

This could explain why we don’t find quantifiers with *of* but no article (see table): we expect a noun to lose its nominal properties before becoming functional:
Morphological expression of the quantifying function:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>lot / ton / bunch / number</td>
<td>of</td>
<td>books</td>
</tr>
<tr>
<td>a</td>
<td>few / hundred / dozen</td>
<td>books</td>
<td></td>
</tr>
<tr>
<td></td>
<td>many / some / three</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Article: Can the quantifier lexicalize Q?
- Particle: Is the quantifier “noun-enough” to trigger a particle?

**Diachronic example: dozen**

*Dozen* synchronically surfaces only with the article:

(114) A dozen (*of) flowers

Historically, *dozen* also combined with *of* (examples from the Corpus of Historical American English, Davies 2010-):

(115) a dozen of eggs (1828)
(116) three dozen of knives (1836)
(117) a couple of dozen of oranges (1853)
(118) a dozen of nuns (1875)

**Hypothesis:** *Dozen* had nominal properties which it has lost (loss of the particle), but was and is still unable to functionalize Q (continued presence of the article).

5. **Why N to Q?**

**General hypothesis:**
- The ability to express quantity is universal to all human, but whether or not quantificational expressions exist depends on the needs of the linguistic community.
- When innovating new quantificational expressions, languages will either make use of existing resources (such as lexical categories like nouns), or pre-existing quantificational expressions (e.g. *gajillion* modelled on *million*).
- These can eventually grammaticalize into a language-specific category for expressing quantity (e.g. the set of numerals in a language).

**Reasoning:**
Cinque (2005) and Abels and Neeleman (2006) show that cross-linguistically, there seems to be a single order of Merge in the nominal domain (with the existing set of deviations derivable via movement), namely:

(119) Demonstrative > Numeral > Adjective > Noun

This suggests a *functional sequence* in the nominal domain, which includes *quantity*. 
Hachem (2015), building on the Universal Spine Hypothesis of Wiltschko (2014), proposes “universal distinction domains” (a set of projections fulfilling an interpretive function) in the nominal domain, which include Quantity:

(120) The hierarchy of Universal Distinction Domains (Hachem 2015: 57)

- **Linking** > **Anchoring** > **Quantity** > **Classification** > **Identification**
  - **PP/KP** > **DP** > **QP** > **φP** > **√**

**IDENTIFICATION:** Converts a chunk of encyclopedic knowledge into a root for use in the syntactic structure

**CLASSIFICATION:** Classifies the root as an individual (via φP, e.g. number and gender)

**QUANTITY:** Determines the size of quantities (via QP)

**ANCHORING:** Anchors the individual to the utterance (via DP)

**LINKING:** Links the individual to the existing (discourse) structure (via PP / K[ase]P[hrase])

Implications of this style of approach:

- Quantity/quantification is universally available (forming a part of the spine).
- Languages can use language-specific categories, and therefore, we do not expect a universal category for implementing quantity.
- These language-specific categories may involve multiple projections (i.e. the universal distinction domain) which accomplish the function.
- It predicts that we should find plenty of variation in the types of expressions used to express quantity (= category), and potentially, in the types of quantities expressed (e.g. the set of numerals, ranges of quantifiers, etc.).

6. Conclusions

- We seem to find a similarity between lexical categories and quantificational expressions in language.
- Two case studies were considered: Polish numerals (numeral 1000, 5), and English Q-nouns *lot*, *ton*, and *bunch*.
- Numeral 1000 was analyzed as having much of the same functional structure as a lexical noun (presumably due to historical reasons). This meant that it had a number of noun-like properties, despite functioning as a quantifier.
- Q-nouns *bunch*, *lot*, and *ton* were analyzed as roots which could not lexicalize Q. The similarity to nouns arose from a combination of factors: (a) properties of Q (must be lexicalized) and their inability to do so, (b) properties of *of* and their more lexical nature.
- The similarity to nouns that we see in the Polish and English systems likely derives from them having had a nominal status in the past.
7. References


8. Appendix: The syntax of numeral 5

Polish numeral 5-10 and 100 showed one further difference from numeral 1000.

**Difference:** Numerals 5-10 and 100 show an additional restriction in that they do not combine with inherently plural *pluralia tantum* nouns, while 1000 does.

*Pluralia tantum* morphosyntax:

(121) *Te jedne duże drzwi otworzyły się.*

DEM.NV.PL one.NV.PL big.NV.PL door.PL opened.NV.PL SIE

‘That one big door opened.’

Numerals 5 and 1000 in combination with *pluralia tantum*:

(122) a. *Pięć sań / drzwi*

Five.CARD sleighs.GEN / doors.GEN

‘Five sleighs / doors’

b. *Tysiąc sań / drzwi zepsuło się.*

Thousand sleighs.GEN / doors.GEN broke.N.SG SIE

‘A thousand sleighs / doors broke.’

The problem is solved by using a “collective” numeral (Swan 2002, Kim 2009, Saloni 2009), or inserting a non-*pluralia tantum* noun.

(123) a. *Pięcioro sań / drzwi*

Five.COLL sleighs.GEN / doors.GEN

‘Five sleighs / doors’
In Klockmann (2017), I propose the following syntactic analysis:

(124)

- The numeral is base-generated under the #P of the quantified noun. This prevents it from co-occurring with pluralia tantum nouns which require adjacency.
- It head moves to Q through #. This captures:
  (a) Word order: the numeral usually precedes adjectives which would be base-generated under QP.
  (b) Gender marking: Gender in Polish is linked to number – the plural expresses a virile, non-virile distinction and the singular an animate-inanimate distinction; by head-moving through #, the numeral acquires the gender specification of the quantified noun.
  (c) Case assignment: Movement of the numeral separates the phi-features of the noun, which are then treated as separate phi-bundles for case computation. Genitive is the default case in the nominal domain, which is assigned to the quantified noun. The numeral acquires the case of the case context.