What are categories?

Adjective-like and noun-like semi-lexical numerals in Polish

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Main theoretical claims

• Categories do not form discrete groups with clear, easily definable boundaries
• Categories are derived notions (not syntactic primitives); they can be identified via their feature sets – this allows for “intermediate” elements (like numerals)

Central data

• Polish numerals, specifically 2,3,4 and 5-10, 100.

1. Background

Corbett (1978: 368) states two universals concerning cardinal numerals:

• Simple cardinal numerals fall between adjectives and nouns
• If they vary in behavior it is the higher which will be more noun-like

This can be seen in Polish:

Table 1: Adjectival and nominal properties of numerals

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Property</th>
<th>Adj</th>
<th>1</th>
<th>2,3,4</th>
<th>5-10, 100</th>
<th>1000</th>
<th>Noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjectival</td>
<td>Case agreement (structural positions)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Case agreement (oblique positions)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Gender agreement</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Number agreement</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nominal</td>
<td>Genitive assignment (structural positions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Genitive assignment (oblique positions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Has plural morphology</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Generalizations:

• Numeral 1 looks like an adjective
• Numeral 1000 looks like a noun
• Numerals 2,3,4 and 5-10, 100 share properties with both nouns and adjectives

Question: Numerals in Polish behave in some respects like adjectives and in others like nouns. How can we capture this in terms of categories?

¹ In association with the VIDI Project “The Uniformity of Linguistic Variation”, http://linguisticvariation.com/en/
2. Data

Three unexpected behaviors of Polish numerals (if they were adjectives or nouns): (1) 5+ induced agreement mismatches, (2) gender induced agreement mismatches, and (3) a case alternation

2.1 5+ INDUCED AGREEMENT MISMATCHES

→ Occurs with numerals 5-10,100 (5+), but not with 1, 2,3,4, 1000 or lexical nouns and adjectives

Agreement Mismatches: Mismatches between the features of the Probe and would-be Goal (e.g. Five cats, *is* sleeping)

Numerals 5+ (5-10, 100): neuter singular verbal agreement (regardless of the gender of noun)

(1) a. Pięć dziewczyn / ptaków zjadło
   Five girl.F.PL.GEN bird.M.PL.GEN ate.N.SG
   ‘Five girls / birds ate’

b. Pięć okien rozbiło się
   Five window.N.PL.GEN broke.N.SG PART
   ‘Five windows broke’

Numerals 1 & 2,3,4 & adjectives: verbal agreement in gender/number of the noun

→ Note: Numerals 1 and adjectives also agree with the noun in gender/number/case. Numerals 2,3,4 show gender/case agreement but not number agreement (e.g. *dwie dziewczyna.SG ‘two girl’ vs. jedne.PL ptaki.PL ‘some (lit. one) birds’).

(2) a. Jedna głodna dziewczyna zjadła
   One.F.SG.NOM hungry.F.SG.NOM girl.F.SG.NOM ate.F.SG
   ‘One hungry girl ate’

b. Jeden głodny ptak zjadł
   ‘One hungry bird ate’

c. Jedno ciężkie okno rozbiło się
   One.N.SG.NOM heavy.N.SG.NOM window.N.SG.NOM broke.N.SG PART
   ‘One heavy window broke’

d. Jedne ciężkie drzwi rozbiły się
   One.PL.NOM heavy.PL.NOM door.PL.NOM broke.NV.PL PART
   ‘One heavy door broke’

(3) a. Dwie dziewczyny zjadły
   Two.F.NOM girl.F.PL.NOM ate.NV.PL
   ‘Two girls ate’

b. Dwa ptaki zjadły
   Two.M/N.NOM bird.M.PL.NOM ate.NV.PL
   ‘Two birds /children ate’

c. Dwa okna rozbiły się
   Two.M/N.NOM window.N.PL.NOM broke.NV.PL PART
   ‘Two windows broke’

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2 The list of abbreviations is as follows: ACC = accusative; DAT = dative; DEV = devirilized gender; F = feminine; GEN = genitive; INST = instrumental; LOC = locative; M = masculine; MP = masculine personal gender; N = neuter; NOM = nominative; NV = non-virile gender; PART = particle; PL = plural; SG = singular; V = virile gender

3 In the plural, there are two relevant genders for verbal agreement: masculine personal and non-masculine personal. Verbal agreement with masculine personal is traditionally labeled “virile” and with non-masculine personal “non-virile”. This is maintained with the glosses V and NV.
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**Numeral 1000**: verbal agreement in gender/number of the numeral (regardless of the gender of the noun)

➔ Note: Agreement can only occur if the numeral is modified

(4) a. Cały tysiąc dziewczyn / ptaków zjadł
‘A whole thousand girls / birds ate’

b. Cały tysiąc okien rozbili się
‘A whole thousand windows broke’

**Nouns**: verbal agreement in gender/number of the noun (regardless of the gender of the lower noun)

(5) Student fizyki zjadł
Student.M.SG.NOM physics.F.SG.GEN ate.M.SG
‘A student of physics ate’

(6) **Generalization on verbal agreement** (to be revised):
In constructions of the type X Y (numeral-noun, adjective-noun, noun-noun),
where X is a numeral, adjective, or noun, and
Y is a noun

if X = 1 or 2,3,4 or an adjective, then verbal agreement occurs with Y
if X = 5+, then verbal agreement targets neither, but is neuter singular
if X = 1000 or a noun, then verbal agreement occurs with X

<table>
<thead>
<tr>
<th>Agreement occurs with:</th>
<th>X</th>
<th>Neither</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>For:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nouns</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 **GENDER INDUCED AGREEMENT MISMATCHES**

➔ Occurs with numerals 2,3,4 and 5+, but not with 1, 1000, or lexical nouns and adjectives

Gender induced agreement mismatches are triggered by the masculine personal and devirilized masculine subgenders, where

Masculine Personal (MP) nouns have masculine gender, refer to a human, and trigger masculine personal morphology on adjectives and verbs in nominative contexts (examples: wujek ‘uncle’, sąsiad ‘neighbor’, and student ‘student’)

(7) Przystojni studenci / sąsiedzi zjedli
Handsome.MP.PL.NOM student.MP.PL.NOM / neighbor.MP.PL.NOM ate.V.PL
‘Handsome students / neighbors ate’

and

Devirilized (DEV) nouns have masculine gender, refer to a human, but do not trigger masculine personal morphology on adjectives and verbs (examples: karzel ‘dwarf’, brudas ‘slob’, and garbus ‘hunchback’)

3
Heidi Klockmann

(8) Przystojne karły / garbusy zjadły
Handsome.M.PL.NOM dwarf[DEV].M.PL.NOM / hunchback[DEV].M.PL.NOM ate.NV.PL
‘Handsome dwarves / hunchbacks ate’

Numerals 2,3,4: Optional agreement mismatch when the noun is masculine personal or devirilized. Leads to non-nominative case morphology on both numeral and noun.

(9) a. Dwóch studentów / karłów / *ptaków zjadło
Two.GEN student.M.PL.GEN / dwarf[DEV].M.PL.GEN bird.M.PL.GEN ate.N.SG
‘Two students / dwarves / *birds ate’

b. Dwaj studenci zjedli
Two.M.PL.NOM student.M.PL.NOM ate.V.PL
‘Two students ate’

c. Dwa karły / ptaki zjadł y
Two.M.NOM dwarf[DEV].M.PL.NOM / bird.M.NOM.PL ate.NV.PL
‘Two dwarves ate’

Numerals 5+: Presumed agreement mismatch when the noun is masculine personal or devirilized (also due to the presence of 5+, making it a combination of 5+ and gender induced). Leads to special morphology on the numeral itself.

(10) a. Pięć studentów / karłów zjadło
Five.OBLIQUE student.M.PL.GEN / dwarf[DEV].M.PL.GEN ate.N.SG
‘Five students / dwarves ate’

b. Pięć ptaków zjadło
Five.NOM/ACC bird.M.PL.GEN ate.N.SG
‘Five birds ate’

Numerals 1 & 1000, adjectives, & nouns: No effect on verbal agreement (e.g. same as in 2.1)

(11) a. Jedni przystojni studenci zjedli
One.M.PL.NOM handsome.M.PL.NOM student.M.PL.NOM ate.V.PL
‘Some handsome students ate’

b. Jedne przystojne karły zjadły
One.M.PL.NOM handsome.M.PL.NOM dwarf[DEV].M.PL.NOM ate.NV.PL
‘Some handsome dwarves ate’

(12) a. Cały tysiąc studentów zjadł
‘A whole thousand students ate’

b. Cały tysiąc karłów zjadł
‘A whole thousand dwarves ate’

(13) a. Studentki bratów zjadły
Student.F.PL.NOM brother.M.PL.GEN ate.NV.PL
‘(My) brothers’ students(female) ate’

b. Studentki karłów zjadły
Student.F.PL.NOM dwarf[DEV].M.PL.GEN ate.NV.PL
‘(The) dwarves’ students(female) ate’
(14) **Generalization on MP and DEV gender:** If the gender of the noun is masculine personal or devirilized and the numeral is 2,3,4 or 5+, there is an agreement mismatch, optionally for 2,3,4, and obligatorily with 5+. With 5+ numerals, the only difference from 5+ induced agreement mismatches is the presence of additional morphology on the numeral, -u. With 2,3,4, these mismatches require non-nominative case marking on the numeral and noun.

(15) **Generalization on verbal agreement** (revised):
In constructions of the type X Y (numeral-noun, adjective-noun, noun-noun),
where X is a numeral, adjective, or noun and
Y is a noun
if X = 1 or an adjective, then verbal agreement occurs with Y

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</tr>
</thead>
<tbody>
<tr>
<td>For:</td>
<td>1000</td>
<td>5+</td>
<td>1</td>
</tr>
<tr>
<td>Nouns</td>
<td>2,3,4 (MP, DEV)</td>
<td>2,3,4 (Adjectives)</td>
<td></td>
</tr>
</tbody>
</table>

**Adding to the first table…**

Table 2: Adjectival, nominal, and semi-lexical properties of numerals

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Property</th>
<th>Adj</th>
<th>1</th>
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<th>5-10, 100</th>
<th>1000</th>
<th>Noun</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjectival</strong></td>
<td>Case agreement (structural positions)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Case agreement (oblique positions)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Gender agreement</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>-</td>
</tr>
<tr>
<td></td>
<td>Number agreement</td>
<td>+</td>
<td>+</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Nominal</strong></td>
<td>Genitive assignment (structural positions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Genitive assignment (oblique positions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Has plural morphology</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Semi-lexical</strong></td>
<td>5+ mismatches</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Gender mismatches</td>
<td>-</td>
<td>-</td>
<td></td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Recall that with masculine personal and devirilized gendered nouns with the 2,3,4 numerals there is the option of non-nominative case-marking on the numeral and noun. I treat these as cases of genitive assignment, which accounts for the “+” in the table.

Recall that numeral 1000 only induces verbal agreement if modified; thus, it does enter into 5+ mismatches although I do not address that here.
3. Necessary ingredients for the analysis

3.1 DEFAULT AGREEMENT AND DEFAULT CASE

Default Agreement (Preminger, 2011): Agree is obligatory, but its success is not. If Agree fails, default features are inserted.

In Polish, default verbal features are neuter singular (Dziwirek, 1990):

**Infinitival subjects**

(16) Wyłożyć byłoby dla mnie tragedią
    To.grow.bald would.be.N.SG for me.GEN tragedy.INST
    ‘To grow bald would be a tragedy for me’ (modeled after Swan 2002: 391)

**Impersonals**

(17) Nudziło mi się
    Was.bored.N.SG me.DAT PART
    ‘I was bored’

**Weather verbs**

(18) Padło
    Rained.N.SG
    ‘It rained’

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**Claim: Agreement mismatches (5+ and gender induced) are instances of default agreement**

This claim is further corroborated by the fact that the coordination of two 5+ numeral phrases does not lead to plural agreement, but again the neuter singular, which would be unexpected if these numerals carried neuter singular features:

(19) a. Pięć krzesel i sześć biurek zapadło się
    Five chair.N.PL.GEN and six desk.N.PL.GEN collapsed.N.SG PART
    ‘Five chairs and six desks collapsed’
b. Krzesła i biurka zapadły się
    Chair.N.PL.NOM and desk.N.PL.NOM collapsed.NV.PL PART
    ‘Chairs and desks collapsed’

In Polish, default case is nominative (Schütze, 2001):

(20) Ty, ja, i on (if picking people out from a crowd)
    You.NOM I.NOM and he.NOM
    ‘You, me, and him’

(21) Ja / *mnie? Nie chce mi się iść dzisiaj
    I.NOM / *ACC? No want me.DAT PART to.go today
    ‘Me? I don’t feel like going today’

(22) Jan i ja / *mnie poszliemy do kina
    John.NOM and I.NOM / *I.ACC went to cinema
    ‘John and me went to the cinema’
3.2 GENDER INDUCED AGREEMENT MISMATCHES LEAD TO GENITIVE MARKING

Franks (1994, 2002), Przepiórkowski (2004), and Rutkowski (2002) claim the case on 5+ numerals with masculine personal nouns, e.g. in gender induced agreement mismatches is accusative. (Note that 2,3,4 generally remain unaddressed.) Contra them,

I claim the case on the numeral and noun in gender induced agreement mismatches is genitive.

Evidence: Devirilized nouns which show nominative-accusative syncretisms instead of genitive-accusative syncretisms. The “common” case between devirilized and masculine personal nouns with agreement mismatches is genitive, not accusative, in both nominative and accusative case contexts.

Table 3: Nominative Context

<table>
<thead>
<tr>
<th>Masculine Personal</th>
<th>Devirilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwaj</td>
<td>Dwa</td>
</tr>
<tr>
<td>MP NOM</td>
<td>M NOM/ACC</td>
</tr>
<tr>
<td>Dwój</td>
<td>Dwój</td>
</tr>
<tr>
<td>GEN/ACC</td>
<td>GEN/ACC</td>
</tr>
<tr>
<td>Two</td>
<td>Two</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>chłopcy</td>
<td>karły</td>
<td>zjedli</td>
</tr>
<tr>
<td>V.PL</td>
<td>NOM/ACC</td>
<td>NV.PL</td>
</tr>
<tr>
<td>zjadlo</td>
<td>karłów</td>
<td>zjadlo</td>
</tr>
<tr>
<td>N.SG</td>
<td>GEN</td>
<td>N.SG</td>
</tr>
<tr>
<td>ate</td>
<td>dwarves</td>
<td>ate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Masculine Personal</th>
<th>Devirilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widziałam</td>
<td>Widziałam</td>
</tr>
<tr>
<td>GEN/ACC</td>
<td>M.NOM/ACC</td>
</tr>
<tr>
<td>dwóch</td>
<td>dwóch</td>
</tr>
<tr>
<td>GEN/ACC</td>
<td>GEN/ACC</td>
</tr>
<tr>
<td>I saw</td>
<td>I saw</td>
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</tbody>
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<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>dwóch</td>
<td>dwa</td>
<td>karły</td>
</tr>
<tr>
<td>chłopców</td>
<td>M.NOM/ACC</td>
<td>NOM/ACC</td>
</tr>
<tr>
<td>chłopców</td>
<td>dwóch</td>
<td>karłów</td>
</tr>
<tr>
<td>N.SG</td>
<td>GEN</td>
<td>GEN</td>
</tr>
<tr>
<td>boys</td>
<td>dwarves</td>
<td>boys</td>
</tr>
</tbody>
</table>

3.3 STRUCTURE OF NOMINALS AND GENITIVE CASE ASSIGNMENT

Claim: Genitive case in noun-noun constructions is assigned by an intermediate (potentially preposition-like) functional head between the two nominals, labeled FP in the diagram below (see Chomsky, 1981; Emonds, 1985; Siloni, 1997; McFadden, 2004; for similar (silent) case assigners)
4. Analysis

Claim I: Adjectives carry all unvalued phi-features. Nouns carry all valued phi-features (based on Baker, 2003). This is the distinguishing factor between adjectives and nouns.

Claim II: It is possible to have elements with combinations of unvalued and valued (or missing) phi-features. These elements will show intermediate or unexpected behaviors.

Essence of the analysis:
- Numeral 1: adjective with unvalued phi-features (gender, number) and unvalued case
- Numerals 2,3,4: noun-adjectives with unvalued gender, valued number, and unvalued case
- Numerals 5+: semi-lexical nouns with valued number, missing gender, and unvalued case
- Numeral 1000: noun with valued phi-features (gender, number) and unvalued case

Table 5: Feature specifications

<table>
<thead>
<tr>
<th>Adjectives, 1</th>
<th>2,3,4</th>
<th>5+</th>
<th>1000, Nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unvalued gender</td>
<td>Missing gender</td>
<td>Valued gender</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unvalued number</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

- Numerals 2,3,4, 5+, and 1000 take the structure of nominals as in (23). FP has the following properties for these numerals:
  - The \( f \) selected by numerals 2,3,4 and 5+ is defective and as a result cannot “read” MP or DEV genders.
  - Additionally, the \( f \) selected by numerals 2,3,4 is only active with MP and DEV genders, while the \( f \) selected by numerals 5+ is always active.
  - The \( f \) selected by numeral 1000 (and nouns) is fully active and not defective

Motivation for proposed feature sets:

Numerals 1:
- Agrees in gender, number, and case in all positions; thus, unvalued gender, number, and case (like an adjective).

Numerals 2,3,4:
- Agrees in gender (‘two’: \( d\text{wie}N, d\text{waM}N, d\text{waM}aj \)); thus, unvalued gender.
- No number agreement or number morphology; thus, valued number (proposed to be inherently plural).
- Has case morphology (\( d\text{wa}\text{m}\text{NM}N/\text{ACC}, d\text{w\o\c}\text{ch}\text{M}N/\text{LOC}, d\text{w\o\c}\text{m}\text{MA}N/\text{INST}, d\text{w\o\c}\text{m}\text{M}N/\text{DAT} \)); thus, unvalued case.

Numerals 5+:
- No gender agreement; proposed missing gender feature (also claimed in Dziwirek, 1990).
  - Historical argument: 5+ numerals were once nominal heads that triggered feminine singular agreement on the verb (Miechowicz-Mathiason & Dziubala-Szrejbroska, 2012; Rutkowski, 2006). Now they do not, which could indicate a loss of the gender feature.

(24) Ona siedm panien szła
that.F.NOM seven.NOM maidens.GEN walked.F.SG
‘Those seven maidens were walking’ (Old Polish – Rutkowski, 2006: 93)
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- **Coordination argument:** If 5+ numerals had neuter gender (since they trigger N.SG on the verb), we would expect the coordination of two 5+ numeral phrases to lead to NV.PL on the verb. However, it still leads to N.SG.

(25) Pięć krzeseł i sześć biurek rozbilo się
Five chairs.GEN and six desks.GEN broke.N.SG PART
‘Five chairs and six desks broke’

- No number agreement or number morphology; thus, **valued number** (proposed to be inherently plural)
- Has case morphology (pięć.NOM, pięcioma.INST, pięciu.GEN/LOC/DAT); thus, **unvalued case**

**Numeral 1000:**
- Triggers MASCULINE verbal agreement; thus, carries **valued MASCULINE gender**

(26) Cały tysiąc dziewczyn zjadł
Whole.M.SG.NOM thousand.M.SG.NOM girl.F.PL.GEN ate.M.SG
‘A whole thousand girls ate’

- Can appear in the singular or plural (tysiąc.SG, tysiące.PL); thus, **valued number** (SG or PL)
- Has case morphology (tysiąc.NOM/ACC.SG, tysiąca.GEN.SG, tysiącowi.DAT.SG, tysiącem.PST.SG, tysiącu.LOC.SG); thus, **unvalued case**

**Table 6: Feature specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Gender</th>
<th>Number</th>
<th>Case</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjective</td>
<td>unvalued</td>
<td>unvalued</td>
<td>unvalued</td>
<td>no</td>
</tr>
<tr>
<td>1</td>
<td>unvalued</td>
<td>unvalued</td>
<td>unvalued</td>
<td>no</td>
</tr>
<tr>
<td>2,3,4</td>
<td>unvalued</td>
<td>PL</td>
<td>unvalued</td>
<td>yes (MP/DEV active)</td>
</tr>
<tr>
<td>5+</td>
<td>—</td>
<td>PL</td>
<td>unvalued</td>
<td>yes</td>
</tr>
<tr>
<td>1000</td>
<td>M</td>
<td>PL, SG</td>
<td>unvalued</td>
<td>yes</td>
</tr>
<tr>
<td>Noun</td>
<td>M, F, N, MP, DEV</td>
<td>PL, SG</td>
<td>unvalued</td>
<td>yes</td>
</tr>
</tbody>
</table>

4.1 **DERIVING 5+ INDUCED AGREEMENT MISMATCHES (NON-MP/DEV GENDERS)**

**Numeral 1, adjectives:** Numeral/adjective agrees in gender/number/case with the noun (27a). Verb agrees with the construction (27b). Numeral 1 behaves identically to an adjective in this regard.
**Numerals 2,3,4:** Numeral agrees in gender with the noun (28a). FP remains inactive. Verb agrees with noun (shared case feature between numeral and noun as in Pesetsky and Torrego (2004), or default nominative on numeral) (28b).

\[(28)\]

\[\begin{align*}
\text{a.} & & \text{b.} \\
\begin{array}{c}
\text{A/N} \\
\text{2,3,4} \\
\text{FP} \\
\text{\_Gen} \\
\text{[P-Num]} \\
\text{\_Case} \\
\end{array} & & \begin{array}{c}
\text{A/N} \\
\text{2,3,4} \\
\text{FP} \\
\text{\_Gen} \\
\text{[P-Num]} \\
\text{[nom-Case]} \\
\end{array}
\end{align*}\]

\[\text{AGREE} \rightarrow \text{Noun} \rightarrow \text{[+Gen]} \rightarrow \text{[P-Num]} \rightarrow \text{[nom-Case]}\]

\[\text{inactive}\]

**Numerals 5+:** FP assigns genitive to the noun (29b). Verb cannot agree with the numeral because it is phi-incomplete, missing gender (29c). Verb cannot agree with the noun because it is already genitive and inactive (29c). Verb receives default agreement features (neuter singular) (29d). Numeral gets default nominative (29d).

\[(29)\]

\[\begin{align*}
\text{a.} & & \text{b.} \\
\begin{array}{c}
\text{FP} \\
\text{\_Gen} \\
\text{\_Num} \\
\end{array} & & \begin{array}{c}
\text{FP} \\
\text{\_Gen} \\
\text{[P-Num]} \\
\text{\_Case} \\
\end{array}
\end{align*}\]

\[\text{AGREE} \rightarrow \text{Noun} \rightarrow \text{[+Gen]} \rightarrow \text{[P-Num]} \rightarrow \text{[gen-Case]}\]
What are categories?

Adjective-like and noun-like semi-lexical numerals in Polish

**Numeral 1000, noun**: FP assigns genitive to the noun (30a). Verb agrees with the phi-complete numeral/noun (30b).

```
(30) a. FP
     F
    / \
   DP/NP
     N
     [+Gen]
     [Pl-Num]

b. TP
     DP/NP
     N
     [+Gen]
     [Pl-Num]
     [nom-Case]
     [sg-Num]
     verb
```
4.2 DERIVING GENDER INDUCED AGREEMENT MISMATCHES (MP/DEV GENDERS)

Numerals 1, 1000, adjectives, & nouns: Same as before (nothing changes). See above.

Numerals 2, 3, 4 & 5+: Mismatches are due to “case-leaking” (leaking of the genitive case of the noun onto the numeral) which is triggered by the masculine personal and devirilized gender values.

- FP selected by these numerals is defective (as opposed to the FP of lexical nouns and 1000)
- $f$ cannot deactivate after agreement with a masculine personal or devirilized noun (32a). It is unclear why this is, but it may have to do with the fact that masculine personal and devirilized genders are more semantic in nature and may be encoded differently.
- $f$ extends its search space upwards and also agrees with and assigns case to the numeral (32b). This is “cyclic agree” (Rezac, 2003).

Cyclic Agree (Rezac 2003): If a probe does not deactivate after a search into its c-command domain, it can also search upwards when new material is Merged. This is due to the Earliness Principle of Pesetsky and Torrego (2001: 400) which states that “an uninterpretable feature must be marked for deletion as early in the derivation as possible”.

(31) a.  

(32) a.  

- (2,3,4 numerals agree in gender with the noun)
- Verb cannot agree with the numeral or the noun as they are both inactive (32c)
- Verb gets default features (32d).
What are categories?
Adjective-like and noun-like semi-lexical numerals in Polish

c.

```
*AGREE (INACTIVE)
```

d.

```
*AGREE (INACTIVE)
```

13
5. **Final Semi-Lexical Behavior: Case alternation**

5.1 **CASE ALTERNATION: DATA**

- Occurs with numerals 5+, but not 1, 2, 3, 4, 1000, or lexical nouns and adjectives

*Case alternation:* The numeral acts as a case-assigner in structural positions, with genitive appearing on the noun, and as a case-agreer in oblique positions, with both numeral and noun showing the same oblique case.

**Numerals 5+:** Noun marked as genitive in structural positions and numeral in its nominative-accusative form. In oblique positions, numeral and noun marked in the same oblique case.

(33) a. Pięć ptaków / dziewczyn zjadło
    Five bird.M.PL GEN / girl.F.PL GEN ate.N.SG
    ‘Five birds / girls ate’

    b. Zjadłam z pięcioma ptakami / dziewczynami
    I[f].ate with[INST] five.INST bird.M.PL INST / girl.F.PL INST
    ‘I ate with five birds / girls’

**Numerals 1, 2, 3, 4, and adjectives:** Case agreement in all positions

(34) a. Jeden głodny ptak zjadł
    ‘One hungry bird ate’

    b. Jedna głodna dziewczyna zjadła
    One.F.SG NOM hungry.F.SG NOM girl.F.SG NOM ate.F.SG
    ‘One hungry girl ate’

    c. Zjadłam z jednym głodnym ptakiem
    ‘I ate with one hungry bird’

    d. Zjadłam z jedną głodną dziewczyną
    I[f].ate with[INST] one.F.SG INST hungry.F.SG INST girl.F.SG INST
    ‘I ate with one hungry girl’

(35) a. Dwa głodne ptaki zjadły
    Two.M/N NOM hungry.M.PL NOM bird.M.PL NOM ate.NV.PL
    ‘Two hungry birds ate’

    b. Dwie głodne dziewczyny zjadły
    One.F.NOM hungry.F.PL NOM girl.F.PL NOM ate.NV.PL
    ‘Two hungry girls ate’

    c. Zjadłam z dwoma głodnymi ptakami
    I[f].ate with[INST] one.M/N.INST hungry.PL.INST bird.PL.INST
    ‘I ate with two hungry birds’

    d. Zjadłam z dwiema głodnymi dziewczynami
    I[f].ate with[INST] one.F.INST hungry.PL.INST girl.PL.INST
    ‘I ate with two hungry girls’

**Numeral 1000 and nouns:** Noun marked as genitive in all positions

(36) a. Cały tysiąc dziewczyn zjadł
    Whole.M.SG NOM thousand.M.SG NOM girl.F.PL GEN ate.M.SG
    ‘A whole thousand girls ate’
What are categories?

**Adjective-like and noun-like semi-lexical numerals in Polish**

b. Zjadłam ze całym tysiącem dziewczyn
   ‘I ate with a whole thousand girls’

(37)  a. Student fizyki zjadł
       Student.M.PL.NOM physics.F.SG.GEN ate.M.SG
       ‘A student of physics ate’

b. Zjadłam ze studentem fizyki
   I[f].ate with[INST] student.M.SG.INST physics.F.SG.GEN
   ‘I ate with a student of physics’

(38)  Generalization on Case: 1, 2,3,4, and adjectives always agree in case with the noun; 5+ enters into a case alternation, between acting as a case-assigner in structural positions (genitive on noun) and a case-agreer in oblique positions (oblique on both numeral and noun); 1000 and nouns appear in the structural/oblique case, their nouns appearing in the genitive.

<table>
<thead>
<tr>
<th>Case agreement</th>
<th>Case assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1000</td>
</tr>
<tr>
<td>2,3,4</td>
<td>Nouns</td>
</tr>
<tr>
<td>Adjectives</td>
<td>5+ (structural positions)</td>
</tr>
<tr>
<td>5+ (oblique positions)</td>
<td></td>
</tr>
</tbody>
</table>

**5.2 DERIVING THE CASE ALTERNATION**

**Basic ingredients:** (1) case stacking; (2) semi-lexicality

Case stacking: The ability of a lexical element to be assigned multiple cases (Matushanksy 2008, 2010; Richards 2007; Pesetsky 2009; Yoon 2004)

Lardil (Richards, 2007: ex. 3): Noun marked with two cases

(39) Ngada latha karnjin-i marun-ngan-ku maarm-ku
    I spear wallaby-ACC boy-GEN-INST spear-INST
    ‘I speared the wallaby with the boy’s spear’

**Claim:** Polish is a case stacking language (as is claimed for Russian by Matushanksy 2008, 2010 and Pesetsky 2009). Only one case may appear overtly, determined by two rules on case ordering:

- **Oblique after Structural** (Matushanksy 2008): as oblique cases are more marked than structural cases they are ordered linearly after structural cases [Note: In its original formulation, Matushanksy states that they are ordered before structural cases; I have changed this to make the two rules compatible. The effect is the same]
- **One Suffix Rule** (Pesetsky, 2009: 2): only the final overt inflectional suffix on a noun is pronounced

**Examples: Negation & Numerals**

Case stacking with Negation: In negated sentences, accusative objects are marked as genitive, whereas oblique objects remain oblique. This can be derived with the two rules.
Heidi Klockmann

(40)  a. Nie widziałam książki / *książkę
    Not I.saw book.GEN/*ACC
    ‘I did not see the book’
  b. Nie handlowałam książkami / *książek / *książki
    Not I.deal.in books.INST/*GEN/*ACC
    ‘I do not deal in books’

  a. book-ACC-GEN  →  book-GEN (One Suffix)
  b. books-INST-GEN  →  book-GEN-INST (Oblique after Structural)  →  book-INST (One Suffix)

Case stacking with Numerals:

(41)  a. Pięć dziewczyn zjadł
    Five girl.F.PL.GEN ate.N.SG
    ‘Five girls ate’
  b. Zjadłam z pięcioma dziewczynami
    I.ate with five.INST girl.F.PL.INST
    ‘I ate with five girls’

  a. five girls-GEN (no rules apply)
  b. five-INST girls-GEN-INST  →  five-INST girls-INST (One Suffix)

Semi-Lexicality: Elements which exhibit both lexical and functional characteristics are semi-lexical (Corver & Riemsdijk, 2001, or “grammatical nouns, adjectives, and verbs” as in Emonds, 1985).

Claim: Polish 5+ numerals are semi-lexical. Semi-lexical elements cannot serve as the sole host of oblique morphology (under the assumption that there is a tight link between oblique case and theta role assignment (as in the Principles and Parameters framework, e.g. Chomsky, 1981), where functional elements, like numerals, cannot hold theta roles by themselves).

Prediction: There will be oblique case percolation with semi-lexical and functional elements, but not with lexical elements.

EXAMPLES: COŚ, NUMERALS, AND NOUNS

Case percolation with coś: Coś (‘something’) is presumably a semi-lexical element (Rutkowski and Szczegot, 2001), which shows the genitive-oblique case alternation. Due to its semi-lexicality, the oblique case will percolate down to the adjective and be assigned on top of the genitive.

(42)  a. Widziałam coś milego
    I.saw something nice.GEN
    ‘I saw something nice’
  b. Spalałam z czymś miłym
    I.slept with something.INST nice.INST
    ‘I slept with something nice’

  a. something nice-GEN (no rules apply)
  b. with something-INST nice-GEN-INST  →  with something-INST nice-INST (One Suffix)

Case percolation with numerals 5+: 5+ numerals are semi-lexical. Due to their semi-lexicality, the oblique case will percolate down to the noun (which serves as the theta role holder) and be assigned on top of the genitive (see 41 above).
What are categories?

Adjective-like and noun-like semi-lexical numerals in Polish

Lack of case percolation with nouns: Lexical nouns are not functional in any way, and thus not semi-lexical. Therefore, they can serve as the sole host of the oblique morphology (associated with whichever theta role). As a result, case will not percolate down to the lower noun.

(43) a. student Nom physics.GEN zjadł
student.NOM physics.GEN ate.M.SG
‘A student of physics ate’
b. Zjadłam ze studentem fizyki
I.ate with student.INST physics.GEN
‘I ate with a student of physics’

a. student-NOM physics-GEN (no rules apply)
b. with student-INt physics-GEN (no rules apply)

Lack of case percolation with numeral 1000: 1000 does not show semi-lexical behavior (gender induced mismatches or the case alternation). Presumably, it lacks the functional component of 5+ numerals, and can serve as the sole host of oblique morphology (and thus, holder of a theta role). As a result, case will not percolate down to the lower noun.

(44) a. Cały tysiąc dziewczyn spał
Whole.NOM thousand.NOM girls.GEN slept.M.SG
‘A whole thousand girls ate’
b. Zjadłam z tysiącem dziewczyn
I.ate with thousand.INST girls.GEN
‘I ate with a thousand girls’

a. thousand-NOM girls-GEN (no rules apply)
b. with thousand-INt girls-GEN (no rules apply)

6. Conclusion

Table 8: Adjectival, nominal, and semi-lexical properties of numerals

<table>
<thead>
<tr>
<th>Property Type</th>
<th>Property</th>
<th>Adj</th>
<th>1</th>
<th>2,3,4</th>
<th>5-10, 100</th>
<th>1000</th>
<th>Noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjectival</td>
<td>Case agreement (structural positions)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Case agreement (oblique positions)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Gender agreement</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Number agreement</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nominal</td>
<td>Genitive assignment (structural positions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Genitive assignment (oblique positions)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Has plural morphology</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Semi-lexical</td>
<td>5+ mismatches</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Gender mismatches</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Case alternation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>
The mixed behavior of numerals 2,3,4 and 5+ can be modeled by appealing to their featural makeup.

- **2,3,4**: adjective-nouns with some valued and some unvalued phi-features. The unvalued features contribute to their adjectival behaviors and the valued feature (with the FP) to their nominal behaviors. Their semi-lexical behavior is a consequence of their inability to select a fully fledged (nominal) FP, related to the fact that they do not have a fully fledged nominal feature set (i.e. all valued phi-features)

- **5+**: semi-lexical nouns with valued and missing phi-features. Under this analysis, they lack in any adjectival behaviors, with seemingly adjectival behaviors (e.g. case realization in oblique positions) related to their semi-lexicality. Their semi-lexical behaviors are due to (1) their missing gender feature (5+ mismatches), (2) their defective FP, related to the fact that they do not have a fully fledged nominal feature set (gender mismatches), and (3) their semi-lexical status and the presence of case stacking in the language (case alternation)

We can imagine that there is a continuum between the lexical “categories” of adjective and noun, defined by an element’s featural makeup.

(45) Adjective (all unvalued) ………………………………………………. Noun (all valued)

We can also imagine that there could be a second dimension of lexical to function, where semi-lexical elements would fall. On this, numerals can be placed. This leaves open the possibility for in-between sorts of elements and semi-lexical elements.

(46) Functional

1 2,3,4 5+ 1000

**Adjective**  **Lexical**  **Noun**

**Questions for Further Research:**

- It is specifically the masculine personal and devirilized genders which trigger case leaking (gender induced agreement mismatches). What is special about the masculine personal and devirilized genders?
- The status of the FP head, f, remains unclear. Note that in the derivations with masculine personal and devirilized genders, it is specifically the gender value of the noun which leads to case leaking – under this analysis, the numeral is also an improper goal (5+: missing gender; 2,3,4: agrees in gender, so also carries MP/DEV). This leads to questions concerning the featural makeup of the FP head – does it also receive default features (like T) due to encountering only improper goals? Do phases play any role in limiting upward case leaking by FP?
- A related question concerns the ability of f to assign GENITIVE multiple times (to defective goals) versus T’s inability to assign NOMINATIVE. Perhaps something along the lines of McFadden’s (2006) analysis of NOMINATIVE representing a lack of case assignment might be appropriate.
What are categories?

Adjective-like and noun-like semi-lexical numerals in Polish

References


