1. **INTRODUCTION**

General puzzle: Polish numeral NP subjects show unexpected case morphology and can fail to trigger agreement:

(1) a. Dwie dziewczyny przyszły.  
   two.F.NOM girl.PL.NOM came.NV.3PL  
   'Two girls/cats came.'

b. Pięć dziewczyn/kotów przyszło.  
   five.NV girl.PL.GEN/cat.M.PL.GEN came.N.3SG  
   'Five girls/cats came.'

Details: core factors: cardinal (2-4 vs. the rest) and gender (virile vs. the rest)

Proposal: the role of surface case morphology in permitting agreement

1.1. **Paucal vs. non-paucal (simplex) cardinals**

Gender and number agreement:

(2) a. Dwie dziewczyny/ dwa koty przyszły.  
   two.F girl.PL.NOM/ two.NV cat.M.PL.NOM came.NV.3PL  
   'Two girls/cats came.'

b. Pięć dziewczyn/kotów przyszło.  
   five.NV girl.PL.GEN/cat.M.PL.GEN came.N.3SG  
   'Five girls/cats came.'

The lower cardinals 2-4 show gender and case agreement with the NP they combine with and trigger plural number agreement on the verb.

Cardinals higher than 5 combine with a genitive-marked NP and fail to trigger agreement on the verb.

In oblique cases the cardinal and the lexical NP are marked with the same case.

1.2. **Virile vs. non-virile lexical NPs**

Polish distinguishes two genders in the plural: masculine personal (a.k.a. virile; containing at least one male) and everything else (Brooks 1975:265, Wiese 2006, etc.):

- pronouns: virile nominative *oni*, accusative *ich* (after prepositions, *nich*) vs. non-virile *one*, accusative *je* (after prepositions, *nie*)
- past-tense verbs and nominative-marked adjectives and participles: virile ending - *i* vs. non-virile - *y*
- accusative-genitive syncretism: with virile NPs accusative is realized as genitive in the plural, with non-virile ones it is realized as nominative

Decaux 1964, Brooks 1975, Swan 2002, etc.: cardinals 'five' and higher are marked genitive in the subject position with virile lexical NPs, and nominative with non-virile ones:

(3) a. Pięciu chłopców przyszło.  
   five.V.GEN boy.M.PL.GEN came.N.3SG  
   'Five boys came.'
b. Pięć dziewczyn/kotów przyszło.
   five.NV. NOM girl.F.PL. GEN/cat.M.PL. GEN came.N.3SG
   ‘Five girls/cats came.’

Demonstratives (as well as APs) require the surface genitive form (*tych*) with virile numeral NPs, and alternate between the surface genitive (*tych*) and the surface nominative (*te*) with non-virile numeral NPs:

(4) a. *tych/*te pięć kobiet/okien/kotów
   this.PL.NV.GEN/ NOM five.NV. NOM woman.PL. GEN/ window.PL. GEN/cat.PL. GEN
   ‘these five women/window/cats’
   b. *tych/*ci pięciu mężczyzn
   this.PL.V.GEN/ NOM five.V. GEN man.PL. GEN
   ‘these five men’

Puzzle: why are virile numeral NPs genitive?

Corbett 1978: the higher cardinals agree with virile NPs in case (why? just-because)

2. **THE ACCUSATIVE HYPOTHESIS AND ALTERNATIVES TO IT**


(5) a. Pięciu chłopców przyszło.
   five.V. ACC=GEN boy.M.PL. GEN came.N.3SG
   ‘Five boys came.’
   b. Pięć dziewczyn/kotów przyszło.
   five.NV. ACC=NOM girl.F.PL. GEN/cat.M.PL. GEN came.N.3SG
   ‘Five girls/cats came.’

Being accusative, numeral NP subjects fail to trigger agreement

But why are numeral NP subjects accusative?

Miechowicz-Mathiasen 2011: a null preposition. Problem: what is it and when/why can it be absent?

Willim 2015: this is not accusative case-marking, but the lack of case-marking: numeral NPs receive default realization of case, as agreement with them fails due to their phi-deficiency (cf. Klockmann 2012, 2013)

Problem: nominative case looks like lack of case (for morphological and distributional rather than purely theoretical reasons). It is far from obvious to construct an Elsewhere rule on these assumptions that would unify accusative and unvalued case while excluding nominative

Willim does not address this issue, as she only considers the realization of unvalued case and does not explore the question of what unifies the realization of unvalued case in the plural with the realization of accusative

Empirical problem: agreement with the paucal cardinals 2-4

3. **THE PAUCAL CARDINALS AND THE ROLE OF SURFACE CASE-MARKING**

General consensus: the paucal cardinals 2-4 appear in the nominative case

Novel claim: the **surface nominative case is an illusion:** paucal cardinals do not differ from the higher cardinals in their case-marking
Evidence: complex cardinals ending in 2-4

3.1. Case-marking with simplex cardinals in subject numeral NPs

With non-virile lexical NPs the nominative illusion is complete:

(6) a. Dwie dziewczyny przyszły.
   two.F girl.F.PL.NOM came.NV.3PL
   'Two girls came.'

   b. Dwa koty przyszły.
   two.NV cat.M.PL.NOM came.NV.3PL
   'Two cats came.'

Virile lexical NPs exhibit two variants, with case-marking correlating with verbal agreement:

(7) a. Dwaj chłopcy przyszli.
   two.V.NOM boy.M.PL.NOM came.V.3PL
   'Two boys came.'

   b. Dwóch chłopców przyszło.
   two.V.GEN boy.M.PL.GEN came.N.3SG
   'Two boys came.'

Only (7a) is compatible with the nominative illusion and hence with the standard view

3.2. Case-marking with complex cardinals in subject numeral NPs

With non-virile lexical NPs the nominative illusion is maintained:

(8) a. Są dwadzieścia dwie kobiety.  
    be.3PL twenty.NV two.F.PL.NOM girl.F.PL.NOM
    There are twenty-two women.

   b. Dwadzieścia trzy koty bawiły się.
    twenty.NV three.NV.NOM cat.M.PL.NOM play.NV.PL REFL
    Twenty-three cats were playing.

With virile lexical NPs the nominative illusion is shattered:

    twenty.NV/twenty.V two/three/four.V.NOM boy.M.PL.NOM came.V.3PL

   b. Dwudziestu dwóch /trzech /czterech chłopców przyszło.
    twenty.V two/three/four.V.GEN boy.M.PL.GEN came.N.3SG
    'Twenty-two/three/four boys came.'

Given that the surface nominative form of non-virile numeral NPs in (6) and (8) contrasts with the surface genitive form of virile numeral NPs in (7b) and (9b), it would be missing the underlying empirical generalization not to assume that paucal cardinals give rise to exactly the same accusative syncretism as higher cardinals do.

As the nominative virile forms dwaj/trzej/czterej in (7a) cannot appear in complex cardinals, it seems reasonable that dwaj/trzej/czterej are not cardinals at all. Independent evidence:

- Swan 2002:190: the nominative form can only be used for all-male groups, which makes it different from all other instances of the virile, which are compatible with a female-male mixture
- Decaux 1964: the nominative form implies specificity
Proposal: the nominative forms are fully adjectival (with intersecive semantics and a full set of phi-features)

The surface-accusative forms are true cardinals, combining with the semantic singular (Ionin and Matushansky 2006)

Conclusion 1: syncrctism in the accusative pattern targets all plural numeral NPs

Conclusion 2: verbal agreement or its lack does not determine case-marking, it's the other way around: it seems highly unlikely that probing by T succeeds with non-virile paucal NPs and fails with virile ones (wrong markedness pattern)

4. VERBAL AGREEMENT PATERNRS AND THE ROLE OF THE INDIVIDUATION FEATURE

Regular plural NPs in the subject position trigger plural agreement on the verb, which can be virile or non-virile:

    boy,M.PL.NOM slept,V.3PL
    The boys slept.

b. Ptaki spały.
    bird,M.PL.NOM slept,NV.3PL
    The birds slept.

The higher cardinals 5&up fail to trigger agreement. Why?

Frequent answer (Schenker 1971, Franks 1994, 1995, Przepiórkowski 1997 and Miechowicz-Mathiasen 2011, 2012) : because they are accusative. However, the paucal cardinals 2-4 are (or are not) accusative to exactly the same degree

4.1. Phi-deficiency of cardinals: gender

Klockmann 2012, 2013: NPs headed by cardinals 5&up lack the gender feature

Impossible: NP-external agreement of numeral NPs depends on whether they are virile

APs agreeing with non-virile numeral NPs can surface as either genitive or nominative, in any combination (Przepiórkowski and Patejuk 2012, examples 7, 9, 10 and 11):

(11) a. Następne kilkadziesiąt metrów było czyste.
    next,NOM several ten,PL.NOM meter,PL GEN was,N.3SG clean,NOM
    'The next few tens of metres were clean.'

b. Kolejnych jedenaście zarzutów było podobnych.
    further,GEN eleven,NOM charge,PL.GEN was,N.3SG similar,GEN
    'Further eleven charges were similar.'

c. Kolejne pięćdziesiąt aut zostało uszkodzonych.
    further,GEN fifty,NOM car,PL,GEN became,N.3SG damaged,GEN
    'Further fifty cars became damaged.'

d. Minionych dwanaście miesięcy było najgorsze w historii.
    past,GEN twelve,NOM month,PL,GEN was,N.3SG worst,NOM in history
    'The past twelve months were the worst in history.'

(12) Pięć osób przyszło pijanych/pijane.
    five,GEN person,PL,GEN arrived,NSG drunk,GEN/NOM
    'Five people arrived drunk.'
For virile numeral NPs only the genitive option is available:

(13) Następnych/*następne kilkadziesiat mężczyzn było czystych/*czyste.
next.PL/GEN several ten.PL.NOM man.PL.GEN was.N.3SG clean.GEN/NOM
‘The next few tens of men were clean.’

The two agreement options are not phase-bound (see also Witkoś 2008):

(14) a. Pięć osób próbowało być szczesliwych / szczesliwe.
Five person.PL.GEN tried.N.3SG be.INF happy.GEN/happy.NOM
‘Five people tried to be happy.’

b. Pięć osób próbowało przyjść pijanych/pijane.
five person.PL.GEN tried.N.3SG arrive.INF drunk.GEN/drunk.NOM
‘Five people tried to arrive drunk.’

Irrespective of whether the virile specification is formal or semantic underlyingly, it must be syntactically available as a formal feature in order to trigger agreement.

It is possible that numeral NPs are not specified for the gender features responsible for the feminine/masculine/neuter and animate/inanimate distinctions, but there is no evidence to suggest that these distinctions are ever operative in the plural.

NB: Apparent exceptions are the cardinal dwóch/dwie/dwa/dwu ‘two’ and its definite counterpart obu/obie/oba ‘both’, but the theoretical approach to cardinals that we adopt (Ionin and Matushansky 2006) entails that the lexical NP here is formally singular.

4.2. Phi-deficiency of cardinals: case; person

Willim 2015: NPs headed by cardinals 5&up lack the case feature (in structural case positions only) and the person feature (exact details immaterial).

The virile genitive and non-virile nominative result from the PF component providing default realizations for unmarked values.

Problems with this view:

- lack of person: the general view is that third person is the lack of person features; no independent evidence
- lack of case: does not extend to oblique case environments (no explanation for this distribution provided); nominative is the lack of case (used in citation, and likely in hanging topics)

Agreement with non-virile paucal NPs does not fit into this view either.

4.3. Phi-deficiency of cardinals: individuation

Our proposal (cf. Matushansky and Ruys 2015): numeral NPs lack the individuation feature.

Primary evidence for a feature distinguishing measure nouns from all other nouns: number marking in measure pseudo-partitives cross-linguistically:

(15) a. xamiša kilo kemax
five kilo flour
five kilos of flour

b. šloša dolar
three dollar
three dollars
(16) tre liter vand
three liter water
three liters of water

(17) Er staat drie liter/liters water op tafel.
There stand-SG three liter-SG/PL water on table.

(18) 180 k’ilometrō-n
180 kilometer-DEF
the 180 km [separating the capital from Tonnerre]

Similar facts obtain for NPs-external agreement: measure NPs very frequently fail to trigger agreement:

(19) a. Prošlo/*prošli pjat’ let.
went.NSG/PL five years.GEN
Five years passed.

b. Hiru litro ardo edan du/ditu.
three liter wine drunk AUX.SG/AUX.PL
He/she drank three liters of wine.

Polish itself offers evidence of the same kind:

(20) Zagrodzone jest prawie cale przejście, zostało metr szerokości do przeciskania.
barred is almost entire passage left.NSG meter width.GEN to squeeze
Almost the entire passage was barred, there was a meter of width left to squeeze.

Alexander 2002-2003 citing Doroszewski 1995: with measure nouns even nominative plural numeral NPs can fail to trigger agreement (confirmed with native speakers):

(21) a. Ubyły/ubyło cztery centymetry wody.
diminish.PAST.NV.PL/N.SG four.NV centimeter.M.PL.NOM water.GEN
The water had gone down 4cm.

b. Zostały/zostało nam dwie godziny.
remain.PAST.NV.PL/N.SG us.DAT two.F minute.F.PL.NOM
We had two minutes left.

Measure NPs, like numeral NPs, can fail to trigger agreement on T

Numeral NPs must fail. Whence the difference?

Proposal: cardinals are specified as [-individuated], whereas measure nouns bear this feature optionally

5. REMAINING ISSUES

Where does the accusative case-marking come from?

What about paucal cardinals and obligatory agreement with non-virile numeral NP subjects?

What about agreement with adjectives, quantifiers and demonstratives?

5.1. A morphological approach to the Accusative Hypothesis

Hypothesis advanced: T cannot agree with [-individuated] subjects

- Which case do such subjects have? Answer: accusative
- How can non-virile paucal NP subjects trigger agreement? Answer: it’s semantic agreement
The Accusative Hypothesis (Schenker 1971): the accusative case on numeral NP subjects is the accusative of measure (which is detectable as the accusative case for feminine nouns):

(22) a. *Furę książek zostało w starym domu.* Schenker 1971
   a.lot.ACC book.PL.GEN remained.NSG in old house
   A *lot of books remained in the old house.*

   b. *Było jeszcze kupę czasu.*
   was.NSG still a.lot.ACC time GEN
   *There was still a lot of time.*

The same analysis: nouns denoting measures are specified as [-individuated]

This explains agreement failure. What about the accusative case-marking?

Proposal: accusative as the Elsewhere spell-out of [-individuated]

NB: A functionalist explanation comes to mind whereby direct objects can be treated as non-individuated in some way (lower on the relevant referentiality/individualization scales, cf. all work on Differential Subject/Object Marking). While there might be a connection here, we will not attempt to pursue it here, limiting ourselves to a formal analysis

### 5.2. Two-step agreement

Descriptive generalization: on the assumption that all numeral NP subjects in Polish bear the same case (be it no case or accusative), agreement takes place when the surface realization of this case is the same as nominative

A second round of agreement is necessary for T. At least two options:

- two-step agreement (cf. Ackema and Neeleman 2003, Bonet 2013, Bonet, Lloret and Mascaró 2015, i.a.)
- agreement on the verb is actually a result of two separate agreement processes, one in T, the other in a higher head (C?)

Assuming that agreement interacts with the morphological realization of an NP, the surface case defines the accessibility of an NP to probing (Bobaljik 2008)

NB: In the earlier step no case is assigned and therefore there is no problem

### 5.3. Two agreement options as the question of ordering

Puzzle: NP-internal adjectives and determiners, as well as predicative adjectives show two agreement options for non-virile numeral NP subjects:

(23) *Pięć osób przyszło pijanych/pijane.*
   five person.PL.GEN arrived.NSG drunk.GEN/NOM
   *Five people arrived drunk.*

Przepiórkowski and Patejuk 2012: adjectives can agree either with the (genitive) lexical NP or with the entire cardinal-containing NP (surface-nominative)

Implementation via probing order: D° and A° must be specified for [number] and [gender], minimally:

Assumption: either of these two features can be the first to probe:

NB: the mechanism by which adjectives, especially predicative adjectives, can probe the NPs they agree with is immaterial here

- [gender]: the cardinal is not specified for gender; the goal is the lexical NP; case being a free-rider, it gets valued genitive
[number]: the goal is the cardinal; case being a free-rider, it gets the same value as the cardinal (genitive with virile NPs, nominative with non-virile ones)

Remaining puzzle: for this proposal to work, [gender] and [number] located on the same head should be able to get valued by different goals. Shouldn't this raise problems for defective intervention scenarios?

Possible answer: in this case the different goals are themselves in feature-sharing relations and therefore do not interfere with each other.

Prediction (most likely incorrect): the two cases can be mixed inside an NP in any which way.

6. Conclusion

New empirical generalization: all plural numeral NP subjects in Polish are accusative
Proposed explanation: agreement in Polish is conditioned by individuation
Independent evidence: agreement failure with measure NPs
Numeral NP subjects trigger agreement on the verb in function of their surface case: only surface-nominative ones do
Proposed explanation: a second round of agreement sensitive to case morphology
Apparent nominative forms of paucal cardinals are actually adjectives
Non-verbal agreement is not sensitive to individuation; case on adjectives and determiners is established by which feature probes first, number or gender

7. Bibliography