

On the features and exponence of nominal number in English and beyond

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1 Introduction

1.1 The big picture

Question: What is the purpose of a theory of morphological exponence?

- Given that lexical form–meaning associations are essentially arbitrary, one might expect there to be little of interest to say about the topic.
- In principle, inflectional paradigms could be populated with vocabulary items whose phonological shapes reveal nothing about the morphosyntactic features they spell out.
- (That's how it works with morphologically simple lexical items like *dog* or *pistachio*.)

Answer: To allow surface patterns to offer insight into underlying systems of features and the semantic contrasts they encode.

- The forms associated with inflectional meanings are arbitrary, but their distribution is not random; there are intriguing regularities.
- Syncretisms seem to correlate with shared features (or shared absences of features).
- If we assume that the mapping to VIs is governed by straightforward rules, then patterns in surface realizations can lead to new insights into morphosyntactic features and their semantic content.

Consequences:

- The less complicated and stipulative the rules, the stronger the predictions about the underlying features.
- We therefore pursue a version of Distributed Morphology (DM) that avoids devices such as impoverishment and readjustment rules (Halle & Marantz 1993).
- This talk: What feature system do we get if we try to come up with an elegant account of number syncretisms in English nominals, and does it seem to have wider cross-linguistic relevance?

1.2 Theoretical background

Assumptions about features and their meanings:

- Features are privative.
- Each feature has a single, consistent semantic contribution.
- The exact interpretation of a set of feature specifications depends in part on the system of contrasts in which it participates (Trubetzkoy 1939; Dresher 2009; Hall 2007, 2011; Cowper 2005a; etc.).

E.g., consider a nominal that is specified with the number feature [>1] (Cowper 2005b):

- If this contrasts with nominals specified as [>2], then it is interpreted as dual.
- If it does not, then it is interpreted as plural.

[>1] always contributes the meaning of ‘greater than one,’ but depending on whether the absence of [>2] is contrastive, this may end up signifying either exactly 2 or the range from 2 to ∞ .

- Representations with more specified features are formally more marked than ones with fewer features, but are not necessarily more complex semantically—a combination of features may compose semantically to produce a very simple meaning, and a single feature may have a very complex denotation.
- Morphosemantic features can be either heads or modifiers (Wiltschko 2008, 2009).
 - Head features are grammatically obligatory, and their absence is therefore contrastive. If a head feature is not present, its meaning cannot be present.
 - Modifier features are grammatically optional, and their absence is non-contrastive. If a modifier feature is present, its meaning is present, but if it is absent, its meaning is not excluded.

For example, plurality is encoded in a head feature in English nominals, but by a modifier feature in Halkomelem nominals (examples from Wiltschko 2008: 642):

- (1) a. English:
- i. *the three boys*
 - ii. * *the three boy*
- b. Halkomelem:
- i. *te lhíxw swóweles*
the three boy.PL
‘the three boys’
 - ii. *te lhíxw swíweles*
the three boy
‘the three boys’

2 The puzzle, and our previous account

English nominals present two contrasting syncretic patterns for number, as illustrated in (2).

- | | | | |
|-----|-----------------|------------------|--------------------|
| (2) | MASS | SINGULAR | PLURAL |
| a. | ∅ <i>tea</i> | <i>a book</i> | ∅ <i>books</i> |
| b. | <i>this tea</i> | <i>this book</i> | <i>these books</i> |

Singular count nouns, but not mass nouns or plurals, take the indefinite determiner *a(n)*, but demonstratives, plural marking on nouns, and number agreement on verbs treat mass and singular alike and distinguish the plural.

2.1 Cowper & Hall's (2002) proposal

- (3) Number features (to be revised):

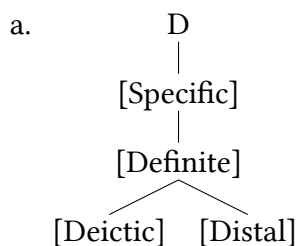
a.	MASS	b.	SINGULAR	c.	PLURAL
			#		#
					[>1]

- Most English nouns have no lexical specification for number; the presence or absence of # determines whether they are interpreted as count or mass.

(Thus 'Universal Grinder' and 'Universal Sorter' examples (Pelletier 1975; Bunt 1985) do not involve coercion, just underspecification, and perhaps some dissonance between lexical meaning and grammatical number.)

- A nominal with no number features is interpreted as mass.
- The feature [#] indicates individuation (countability).
- The feature [>1], a dependent of [#], distinguishes plurals.

- (4) Features of D and their semantic content:



- b. [D]: (potentially) referential
- [Specific]: denoting a particular individual (or group)
- [Definite]: referentially indexed in the Universe of Discourse
- [Deictic]: identified by its relation to the deictic centre
- [Distal]: in the background

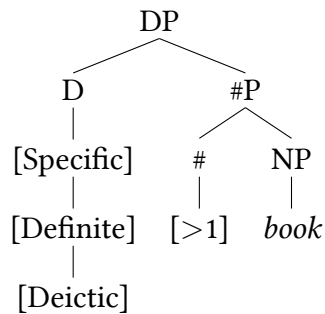
Other relevant assumptions:

- D, #, and N each head a syntactic projection.
- Vocabulary insertion proceeds cyclically from the bottom up.
- The indefinite determiner *a(n)* spells out [D, #].

- Both the null determiner \emptyset and unstressed *söme*¹ spell out [D] alone.
- (Stressed) *this* spells out [Deictic] (and by implication all of its superordinate features).

2.2 What's wrong with this view

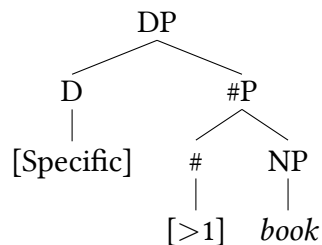
(5) *these books*:



- We might expect this structure to be spelled out as **this books*, with [>1] being spelled out on the noun, and only the features of D spelled out by the determiner.
- The fact that *these* is required instead tells us that vocabulary insertion on D must be sensitive to features of #P.

But this causes problems with the indefinite structure in (6).

(6) (*söme*) *books*:



- Here too, [>1] is spelled out on N. But, assuming that the features of # are visible and available to be spelled out again on D, we expect to D to be realized as *a*, rather than as \emptyset or *söme*, giving **a books*.
 - To prevent this, Cowper & Hall (2002: 64) add a new stipulation to the process of Vocabulary Insertion:
- (7) FREEZING: Once a feature has been licensed by vocabulary insertion, all of its dominating features are invisible to later applications of vocabulary insertion.
- In (6), once [>1] has been spelled out by the insertion of -s, the superordinate feature [#] is no longer visible when vocabulary insertion applies to D (although [>1] itself can still be seen, permitting the distinction between *this* and *these*).

This stipulation works for the English determiner system. But in the ten years since that paper, we have not found any further use for it, and it thus seems to be an *ad hoc* patch rescuing a faulty analysis.

1. Not to be confused with the quantifier *söme*; see Postal (1970).

3 A new approach

3.1 General properties

We propose to replace the number features in (3) by those in (8), while retaining Cowper & Hall's (2002) features of D from (4).

(8)	a. SINGULAR	b. MASS	c. PLURAL
		[Non-Atomic]	[Non-Atomic]
			[Discrete]

- Singular count nominals, in this system, are less marked than mass nouns.
- The feature [Non-Atomic] indicates that a nominal does not denote a single indivisible entity: a nominal with this feature is either plural (composed of multiple discrete entities) or mass (non-discrete, and thus arbitrarily divisible).²
- In English, the absence of [Non-Atomic] is contrastive; i.e., [Non-Atomic] is a head feature. A nominal that lacks [Non-Atomic] will be interpreted as atomic (count and singular).
- Among non-atomic nominals, plurals are distinguished from mass nominals by the feature [Discrete]. Something that is both discrete and non-atomic must be composed of multiple discrete entities.
- (8) shows [Discrete] as a dependent of [Non-Atomic]. What does that signify?
 - Normally, we assume that feature geometries encode semantic entailment relations; they do not contribute any additional restrictions (see Harbour 2011).
 - Here, it's not precisely the case that the semantics of [Discrete] entails the semantics of [Non-Atomic]; after all, a single atom is discrete.
 - However, there is a semantic dependency of a different sort: if [Non-Atomic] is contrastively absent, then [Discrete] cannot be contrastive.
 - Cross-linguistically, there are two types of nominals within which [Discrete] can be contrastive:
 - * Within [Non-Atomic] nominals, [Discrete] distinguishes plural from mass, as in English.
 - * Within nominals of vague (non-contrastively unspecified) atomicity, [Discrete] distinguishes count (singular or plural) from mass, as in Mandarin (see below).
 - So the scope of the contrasts is crucial (Dresher 2009; Hall 2007).
- What this buys us in terms of syncretisms found in English: mass nominals can pattern either with plurals (they are [Non-Atomic]) or with singulars (they lack [Discrete]).

2. Harbour & Elsholtz (2012) uses the feature [\pm Atomic], but in a rather different way.

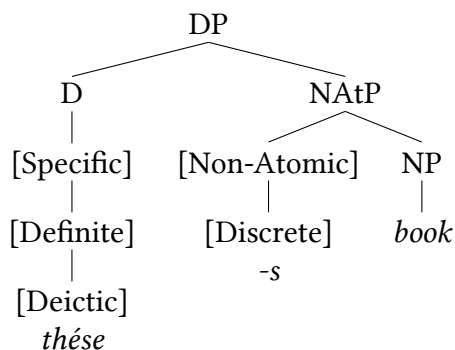
3.2 Accounting for the data

- Below DP, the only overt morphological contrast is between plural and non-plural: [Discrete] is spelled out by -s, which is pronounced on the head noun.³
- We propose that the features [Non-Atomic] and [Discrete], when they are present, are copied onto D in the syntax. Along with the D features in (4), they are spelled out as in (9).

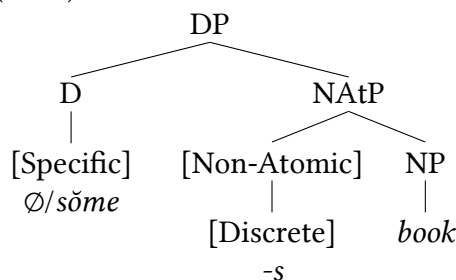
(9) <i>a(n)</i> ⇔ [D] ∅/ <i>sōme</i> ⇔ [Non-Atomic] <i>this</i> ⇔ [Specific] <i>thēse</i> ⇔ [Specific, Dscrt]	<i>the</i> ⇔ [Definite] <i>this</i> ⇔ [Deictic] <i>thēse</i> ⇔ [Deictic, Dscrt]	<i>thāt</i> ⇔ [Distal] <i>thōse</i> ⇔ [Distal, Dscrt] <i>thāt</i> ⇔ [Distal, Deictic] <i>thōse</i> ⇔ [Distal, Deictic, Dscrt]
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- Crucially, *a(n)* is the least marked spellout of D.
- ∅ and unstressed *sōme*, which had previously been the least marked exponents of D, are now more marked than *a(n)*; they spell out [Non-Atomic].
- This means that in plurals and mass nominals, *a(n)* will be blocked by one or the other of these forms.

(10) *these books*:



(11) (*sōme*) *books*:



3.3 Upshot

- English mass–singular syncretisms are straightforwardly captured. Plurals have [Discrete]; mass and singular nominals don't.
- Mass–plural syncretisms are also straightforward; both bear [Non-Atomic].

4 Extensions

We turn now to a demonstration of how the same features can account for patterns in some languages whose nominal systems are superficially very different from that of English.

3. We abstract away from irregular plural morphology.

4.1 Mass and plural as the natural class [Non-Atomic]

Mass–plural syncretisms are predicted by the feature [Non-Atomic]. If this feature is used in other languages, we should find more patterns similar to the behaviour of English \emptyset /*söme*.

4.1.1 Lingala

Mufwene (1980) describes a pattern in Lingala (Bantu) in which mass and plural pattern together:

- Lingala nouns with the class 6 prefix (*ma-*) are usually plural counterparts to singular nouns in class 5 (*li-*).
- Some nouns with *ma-* are ambiguous between a plural and a mass reading, as in (12).

(12)	a.	<i>li-lalá</i>	b.	<i>ma-lalá</i>
		CL5-orange		CL6-orange
		‘an orange’		‘mass of orange’ or ‘two or more oranges’

- Mufwene (1980) argues that the contrast between *li-* and *ma-* is individuated/non-individuated rather than singular/plural; [Non-Atomic] marks this same contrast.

4.1.2 Manam

Manam (Austronesian) has a singular–plural contrast for nominals in general (and also distinguishes dual and paucal for human beings and some animals). Number is not overtly marked on nouns themselves, but is reflected in agreement morphology on verbs and adjectives:

(13) Number agreement in Manam (Lichtenberk 1983: 107)

a.	<i>pátu i-lába</i>	b.	<i>pátu di-lába</i>
	stone 3SG.REALIS-be.big		stone 3PL.REALIS-be.big
	‘The stone is big.’		‘The stones are big.’

Lichtenberk (1983: 269) writes that “for purposes of number indexing, mass nouns are considered plural unless they refer to a single quantity,” giving the examples in (14):

(14)	a.	<i>daŋ di-éno</i>
		water 3PL.REALIS-exist
		‘There is water (available).’
	b.	<i>dan muʔú-muʔu-∅ i-éno</i>
		water little-RED-3SG 3SG.REALIS-exist
		‘There is little (i.e., a small quantity of) water (available).’

This suggests that the ‘plural’ prefix *di-* in fact spells out [Non-Atomic], and is ambiguous between plural and mass in the absence of any vocabulary item specified for [Discrete]. (Dual and paucal markers presumably spell out features dependent on [Discrete], and are also marked for animacy/sentience.)

Corbett (2000: 238), citing Lichtenberk (1983), interprets the singular agreement in (14b) as indicating small quantity (parallel to the use of plural to indicate large quantities of mass nouns in other languages⁴). However, it's not clear from Lichtenberk's description that this is the case; it could be that the singular prefix merely indicates that the water is in a single quantity (as in English *a water*), with the smallness of that quantity coming entirely from the adjective.

4.2 Classifier languages

The same two features we have proposed for English, [Non-Atomic] and [Discrete], can also account for how number is realized in classifier languages. The crucial differences between English and classifier languages come not from the features themselves, but from their syntactic position and their contrastive status.

4.2.1 Western Armenian

Western Armenian has both classifiers and plural marking, but the two cannot co-occur in a single nominal (Bale & Khanjian 2009: 75).

- | | | | |
|---------|--|----|--|
| (15) a. | <i>Shenk-me</i> <i>desa-r.</i>
building-INDEF.SG saw-2SG
'You saw a building.' | c. | <i>yergu had shenk</i>
two CL building
'two buildings' |
| b. | <i>Shenk-er</i> <i>desa-r.</i>
building-PL saw-2SG
'You saw some buildings.' | d. | * <i>yergu had shenk-er</i>
two CL building-PL
intended: 'two buildings' |

Bare nouns in Western Armenian are vague as to number, and can be count or mass:

- | | | |
|---------|--|----------------------------|
| (16) a. | <i>Maro-n</i> <i>tuz g-ude-∅</i> <i>gor.</i>
Maro-DEF fig IMPF-eat-3SG PROG
'Maro is eating fig(s).' | (Sigler 1996: 73) |
| b. | <i>Bezdig vaze-ts.</i>
child run-PAST.3SG
'One or more children ran.' | (Bale & Khanjian 2009: 85) |
| c. | <i>Menk surj</i> <i>xəme-c-ink.</i>
we coffee drink-AOR-1PL
'We drank coffee.' | (Sigler 1996: 60) |

The addition of a quantifier or a numeral can force a plural reading, but does not require the presence of the plural suffix or a classifier:

- | | | |
|---------|---|----------------------------|
| (17) a. | <i>Yergu bezdig vaze-ts.</i>
two child run-PAST.3SG
'Two children ran.' | (Bale & Khanjian 2009: 85) |
|---------|---|----------------------------|

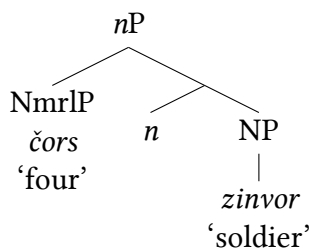
4. See Cowper & Hall (to appear: §3.7.2) for a discussion of this phenomenon in Persian, with an argument that the relevant suffix *-ha* does not actually spell out plural number.

- b. *Šad derev ing-av.*
 many leaf fall.AOR-3SG
 ‘There fell many leaves.’ (Sigler 1996: 167)
- c. *dasə zinvor(-ner)*
 ten soldier(-PL)
 ‘ten soldiers’ (Sigler 1996: 190, 192)
- d. *čors (had) zinvor*
 four CL soldier
 ‘four soldiers’ (Sigler 1996: 47)

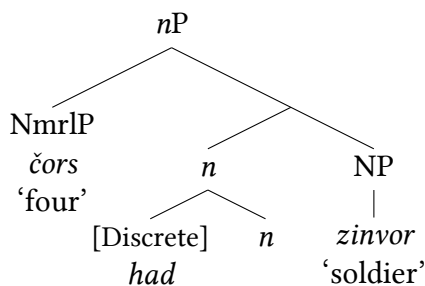
Proposal for Armenian:

- Classifiers spell out [Discrete].
- The plural marker *-(n)er* spells out both [Non-Atomic] and [Discrete].
- Both features appear on *n*, but they are adjuncts, not head features. Their absence is thus non-contrastive, and bare nouns can thus be interpreted as singular or plural, and as count or mass.
- Numerals can appear in the specifier of *nP*, whether or not *n* has any adjunct features.

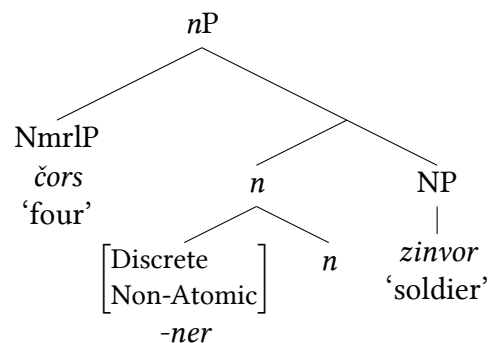
(18) a.



b.



c.



- The indefinite marker *-me* (as in (15a)) forces a singular interpretation of the nominal, and also has consequences for specificity/scope (Sigler 1996). This suggests that it spells out features of D. A full treatment of the Armenian nominal system is beyond the scope of this talk.

4.2.2 Mandarin

Mandarin is a more typical classifier language. Bare nouns can be referential, and no overt morphological indication is required for singular, plural, or mass readings to be possible:

(19) Mandarin (Cheng & Sybesma 2005)

- | | |
|--|---|
| <p>a. <i>Hufei mai shu qu le.</i>
 Hufei buy book go PARTICLE
 ‘Hufei went to buy a book / books.’</p> | <p>b. <i>Hufei he-wan-le tang.</i>
 Hufei drink-finished-PRF soup
 ‘Hufei finished the soup.’</p> |
|--|---|

In order to combine with numerals, nouns require classifiers:

(20) Mandarin (Cheng & Sybesma 1999: 514)

- | | |
|---|---|
| <p>a. <i>san ben shu</i>
 three CL_{VOLUME} book
 ‘three books’</p> | <p>b. *<i>san shu</i>
 three book</p> |
|---|---|

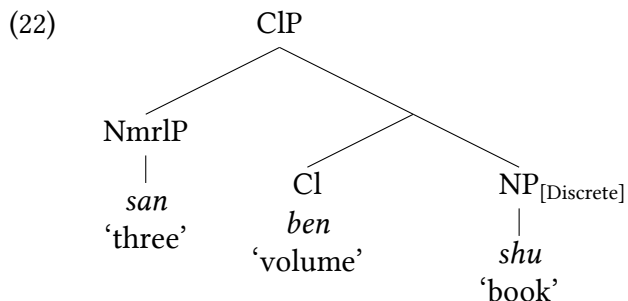
As argued by Cheng & Sybesma (1998, 1999), there is a lexical contrast between count nouns (such as *shu* ‘book’) and mass nouns (such as *tang* ‘soup’). Mass nouns cannot occur with regular classifiers, but can combine with ‘m[ass cl]assifiers’ (which name units of measurement or containers) to form expressions that can be counted (as in (21a)). Count nouns can also combine with massifiers (as in (21b)).

(21) Mandarin (Cheng & Sybesma 1999)

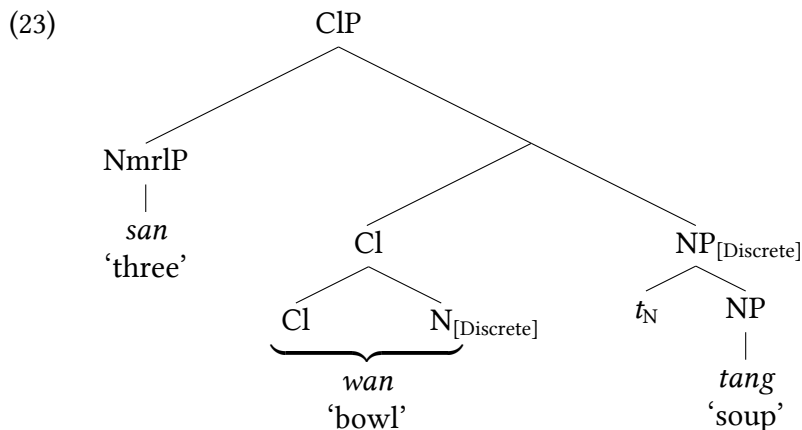
- | | |
|--|---|
| <p>a. <i>san wan tang</i>
 three CL_{BOWL} soup
 ‘three bowls of soup’</p> | <p>b. <i>liang xiang shu</i>
 two CL_{BOX} book
 ‘two boxes of books’</p> |
|--|---|

Proposal for Mandarin:

- The lexical contrast between mass and count nouns is encoded by the feature [Discrete] on N: count nouns have it, and mass nouns don’t.
- Because [Non-Atomic] is not a head feature in the Mandarin number system, [Discrete] distinguishes count from mass, rather than (as in English) plural from singular/mass.
- Regular classifiers presuppose discreteness, and provide a further (possibly non-featural) elaboration of what the discrete units are. They thus require their complements to have the feature [Discrete].



- Massifiers are portmanteau morphemes spelling out an N head with [Discrete], plus a classifier head naming the unit.



- Numerals appear in the specifier of ClP, and thus cannot appear without a classifier.
- Although it mostly lacks morphological plural marking, Mandarin does have a suffix *-men*, which is used only on nominals that are not only plural, but also definite and animate. It cannot co-occur with classifiers (Li 1999):

- (24) a. *Wo qu zhao haizi-men.*
 I go find child-*men*
 'I will go find the children.'
- b. **san ge xuesheng-men*
 three CL student-*men*
 intended: 'three students'

Adapting our (Cowper & Hall to appear) story to our current set of features, we can say that [Non-Atomic] may appear as a modifier on D, and that *-men* spells out the features [Definite, Animate, Non-Atomic] in D. (We assume that [Animate] entails [Discrete]; see Cowper & Hall 2009.)

When *-men* is inserted, N must move to D to serve as a morphological host for the affix. The presence of a classifier blocks the movement of N to D (Li 1999), making it impossible for *-men* to co-occur with a classifier, or with a numeral.

5 Conclusions

Where have our assumptions led us?

- We seem to have a simple and consistent set of number features, with no need so far to resort to readjustment rules or other such devices.
- Cross-linguistic differences in the surface morphology of number—i.e., in how patterns of PF realizations correspond to LF interpretations—arise from:
 - where in the syntactic structure the features appear (e.g., [Discrete] on a functional head in English vs. [Discrete] on N in Mandarin)

- whether the features are heads or modifiers
- the contrastive scope of the features (e.g., [Discrete] in the context of [Non-Atomic] in English vs. [Discrete] by itself in Mandarin)

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