# Bare nouns, measure phrases, and the Hungarian mass/count distinction

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## 1 Introduction

In this talk, we argue that Hungarian notionally singular count nouns like *könyv* ('book'), *toll* ('pen'), and *ház* ('house') are semantically number neutral (see also [3]). This is in opposition to the view that such nouns are dual-life such as *cake* or *stone* in English, as recently argued by [13] and [15]. Number neutral nouns denote a join-semilattice and are therefore compatible with singular and plural interpretations, while dual-life nouns have both mass and count denotations (the nature of these denotations depend on which theory of the mass/count distinction is chosen). The dual-life analysis of the majority of Hungarian nouns rests on (i) the observation that Hungarian notionally singular count nouns are felicitous in numerical constructions with count cardinal quantifiers, but also in measure NPs (pseudo-partitives); and on (ii) the (not uncontroversial) claim that measure NPs require their constituting nouns to have a mass interpretation. One major implication of their analysis is that Hungarian has an unusual distribution of nouns across countability classes, which makes Hungarian (more) like Brazilian Portuguese [12] for instance rather than English. According to [15], Hungarian has few count nouns (only *fej* 'head' and *csepp* 'drop'), a larger number of mass nouns (i.e. 'stuff' and substance denoting nouns like *víz* 'water' and *kosz* 'dirt'), and a many dual-life nouns (e.g. *könyv* 'book', *toll* 'pen', and *ház* 'house')

However, assuming a different and standardly accepted analysis of measure NPs, we arrive at a more adequate analysis of notionally count nouns in Hungarian, and consequently also a different distribution of nouns across Hungarian countability classes. As is standardly assumed (see the original proposal by [8], also [5], [6], [11], [16], [10], i.a.), measure NPs sanction *cumulative* predicates (expressed by mass or bare plural count nouns), but disallow quantized predicates (expressed by singular count nouns). Based on this analysis of measure NPs and the compatibility of the alleged dual-life nouns in Hungarian with a variety of expressions of quantity and quantification, we conclude that they are best interpreted as number neutral predicates as was done on alternative grounds by [3] (see a similar analysis for Catalan and Spanish in [4]). Our proposed analysis of Hungarian notionally singular count nouns, which partially builds on [10], leads us to the conclusion that the Hungarian count/mass distinction and the distribution of nouns across countability classes in Hungarian are aligned with languages like English, rather than Brazilian Portuguese, *pace* previous proposals, including [13] and [15].

## 2 Previous proposal: Dual-life nouns in Hungarian

[13] and [15] have argued that Hungarian has a clear mass/count distinction, but unlike English, many nouns are dual-life in sor far as they freely occur in count or mass syntax. Furthermore, in mass syntax contexts, Hungarian dual-life nouns behave like object ('fake') mass nouns, such as *furniture* in English [15]. For instance *könyv* ('book') may be used in questions with the WH-quantifier *mennyi* ('what quantity of'), as in (1-a) (taken from [15]) Felicitous answers to (1-a) may either measure referents in terms of, for example, weight (1-b) or count its referents in terms of their cardinality (1-c). [15] argue that the availability of (1-b) and (1-c) as answers to (1-a) shows that nouns such as *könyv* ('book') are dual-life nouns because (1-b) indicates the availability of a mass interpretation whereas (1-c) indicates the availability of a count interpretation.

(1)    a.    Mennyi         könyvet   tudsz   cipelni?
              what.quantity.of  book-ACC  able.you  to.carry
              'What quantity of book can you carry?'

        b.    Három kiló-t.
            three   kilo-ACC
            'Three kilos.'

c.  Hármat.
    three.ACC
    'Three.'

Their analysis of measure NPs builds on [14] who independently argues that measure NPs only admit mass noun denotations, which she supports by examples like (2)

(2)   #Twenty kilos of books are lying on top of each other on the floor.

According to [14], (2) is infelicitous because the individual books are not semantically accessible by the reciprocal operator *on top of each other*, and so *each* has no grammatical antecedent. This is precisely because the plural count noun *books* must first shift into a mass interpretation in order to intersectively combine with the measure phrase *twenty kilos of*, which is mass in the intersective analysis of measure NPs in [14], and supported by data like (3) taken from [14] (p. 23, ex. 41b,c).

(3)      a. #I have read many of the twenty kilos of books that we sent.
         b.  I have(n't) read much of the twenty boxes/kilos of books in our house.

Given this analysis, a singular noun like *könyv* ('book') is both mass and count (i.e. dual-life). As a mass noun, *könyv* ('book') denotes a root noun, a plural subset of the mass domain equal to the upward closure of a vague set of atoms ($N_{root}$ = *A where *X = m $\in$ M: $\exists$ Y $\subseteq$ X: m = $\sqcup_M$Y). As a count noun, *könyv* ('book') denotes a set of objects in a context k, which is a set of objects in M and which are countable atoms. Count nouns are derived from the root via the $COUNT_k$ operation, which picks out the set of atoms in context k, the ordered pairs $\langle$d,k$\rangle$: d $\in$ k [14]. Each dual-life noun in Hungarian therefore has two denotations, one mass and one count.

# 3   Counterarguments

The claim that notionally count nouns in Hungarian are dual-life ([13], [15]) heavily relies on the assumption that nouns in measure NPs are mass denoting. We argue against this assumption on empirical and theoretical grounds. We provide four main arguments. First, many native English speakers find (2) acceptable (pace [14]) and straightforwardly interpret it as meaning that the books are stacked one on top of the other, and their cumulative weight is twenty kilos, i.e., the individual books are accessible by *on top of each other*. This weakens the claim in [14] that plural count nouns shift into a mass interpretation when combined wiht measure phrases like *twenty kilos (of)*. Second and related to the first empirical counterargument, on the standardly accepted view ([8], [5], [6], [11], [16], [10], i.a.), measure phrases like *twenty kilos (of)* select for cumulative predicates, which are expressed either by mass (e.g. *flour* or plural count nouns (e.g. *books, apples*), and are built with extensive measure functions (e.g., KILO) which can only apply to cumulative Ps (4) to yield quantized predicates (e.g. *twenty kilos of flour/books*), defined in (5) [**?**]. Crucially, measure phrases (e.g. *twenty kilos (of)*) cannot apply to singular count nouns, because they are already quantized. (Singular count nouns like *fence, wall* fail to be quantized, but this is outside the scope of this talk.) In other words, if Hungarian singular nouns are shown to have cumulative (and thus not-quantized) reference, then there is an alternative answer for the felicity of (1-b) and (1-c).

(4)      $\forall$ P[CUM(P) $\leftrightarrow$ $\forall$ x $\forall$ y[P(x) $\land$ P(y) $\rightarrow$ P(x $\sqcup$ y)]]
(5)      $\forall$ P[QUA(P) $\leftrightarrow$ $\forall$ x $\forall$ y[P(x) $\land$ P(y) $\rightarrow$ $\neg$y$\sqsubseteq$x)]]

The third argument against the assumption that nouns in measure NPs are mass denoting is that plural nouns retain their atomicity when used in measure NPs (see e.g. [10]). This can be shown by the observation that it is posisble to anaphorically refer to atomic individuals in the denotation of a plural count noun in a measure NP (6-a). Such an anaphoric reference is excluded with a mass noun in the same context (6-b), despite its denoting stuff that consists of perceptually and conceptually salient entities (e.g. individual pieces of furniture). However, on the view that nouns in measure NPs uniformly have a mass interpretation [14]—i.e. lack denotations with an accessible atomic structure—which cannot explain the difference between (6-a) and (6-b).

(6)    a.    I bought 500 grams of bonbons and gave each one to a different person.
       b.    I bought 500 grams of furniture # and gave each one to a different person.[1]

The fourth argument is that the same anaphoric accessibility obtains for alleged dual-life nouns like *könyv* ('book') in Hungarian, as in the measure NP *könyv mennyiséget* ('book quantity') in (7). Contrary to the claim of [13] and [15] that *könyv* ('book') must have a mass interpretation in constructions such as (7), it is nonetheless possible to anaphorically refer to the individual books in the measure NP.

(7)    Egy életbe telne       hogy elolvassam a  **önyv-mennyiség-et** amit te   a
       a   life    would.take that read.1s      the book-quantity-ACC      that you the
       nyáron   olvastál. Még ha azok  rövid-ek is.
       summer read.2s  still if  those short-PL too
       'It would take me a lifetime to read the quantity of books that you read this summer.
       Even if they are short!' [7]

## 4   Proposal

Having invalidated the main arguments of [13] and [15] for the dual-life status of notionally count nouns like *könyv* ('book') or *alma* ('apple') in Hungarian, we follow [3] in assuming that such nouns are best analyzed as semantically number neutral. In addition to the data presented in [3], one of our key arguments comes from the observation that in their singular form, nouns denote both singularities and pluralities, and in this sense they are number neutral. For example, one can use the bare singular as in (8) to announce that books have arrived, and then follow up with a specific number, which in this case is four.[2]

(8)    könyv érkezett.     Négy.
       Book  arrived.3SG four
       '(A) Book(s) arrived. Four' [7]

The English version, *A book arrived. Four.* would be infelicitous because a plurality with the cardinality *four* is not in the denotation of the singular *a book*.

Our formal analysis of the mass/count distinction in Hungarian build on [10] in so far as we treat lexical nominal predicates as ordered pairs ⟨**body**(X), **base**(X)⟩, where **body** and **base** are both subsets of the Boolean interpretation domain B: **body**(X), **base**(X) ⊆ B. The **base** is a set of individuals, which via the sum operation ⊔ (9) is used to generate the **body**—i.e. the standard denotation of a noun. The body is therefore a subset of the base (10)—i.e. the body is grounded in the base.

(9)    $*X = b \in B: \exists Y \subseteq X: b = \sqcup Y$ (closure under sum: the set of all sums of elements of X)

(10)    **body**(X) ⊆ *__base__(X)

Count nouns have a disjoint base that is used to generate countable sums in the body. Mass nouns do not have a disjoint base, and therefore do not generate countable sums in the body. A set is disjoint if no two members overlap (11).

(11)    disjointness $\forall x \forall y[P(x) \land P(y) \to x \sqcap y = 0]$

The representation of a number neutral noun like *könyv* ('book') is given in (12), where both its singular and plural interpretations are counted in terms of the same disjoint base BOOK.

(12)    ⟦ *könyv* ⟧ = ⟨*BOOK, BOOK⟩

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[1] While a reviewer noted that *livestock* would be fine in this sort of construction and thus is a counterexample, **??** has shown that such nouns like *cattle* belong in a class of their own, separate from other mass nouns, and we argue that *livestock* belongs in this separate class.

[2] The plural *könyvek érkeztek* ('Books arrived') could also be used, but would entail exclusive reference (only to sums), while the singular makes no commitment to the reference of sums.

Measure NPs (pseudo-partitives) are also represented as $\langle \mathbf{body}(X), \mathbf{base}(X)\rangle$ pairs. For instance, *three kilos of books* has a body consisting of sums of whole, disjoint, countable books that measure up to the appropriate measure value (13). The base is the parts of the set of books that measures three kilos and weighs less than the contextually given measure value $\mathbf{m}$ kilos (14), where $\downarrow$ is an operation used to access entities from entity, measure-value pairs.

(13)     $\mathbf{body}$: $\lambda x.\mathbf{kilo}(x) = 3 \wedge {}^{*}\mathrm{BOOK}(x)$

(14)     $\downarrow\mathbf{base}$: $\lambda y.y \sqsubseteq (\lambda x.{}^{*}\mathrm{BOOK}(x) \wedge \mathbf{kilo}(x) = 3) \wedge \mathbf{kilo}(y) \leq \mathbf{m}_{kilo}$

This representation allows us to capture the following insights: (i) bare plural count nons (which are semantically cumulative) retain their atomicity when used in measure NPs ([8], [10] *pace* [14]) (see e.g. (6-a) and (7)) on the assumption that measure phrases select for cumulative predicates; (ii) measure NPs pattern with count (quantized) nouns under their classifier interpretation (including portion interpretation) [8], [10], [14]; (iii) measure NPs pattern with mass nouns under their measure interpretation [10] [14], which is evident in the possibility of singular subject-verb agreement (see e.g. *Twenty kilos/boxes of books was/were put through the shredder last night*, example taken from [14]). Most importantly, analyzed in this way, measure NPs straightforwardly can admin Hungarian nouns like *könyv* ('book') as long as they are cumulative predicates—i.e. denoting a semi-lattice either mass or count. Moreover, it can be shown that such nouns as *könyv* ('book') fail to behave like mass nouns in a number of other syntactic environments, apart from measure NPs, contrary to [13], [15]. We folllow [3] in proposing that the meaning of lexical nouns like *könyv* ('book') in Hungarian corresponds to the number neutral property, whose denotation is built from the set of book atoms via closure under sum $\sqcup$ (*$\mathbf{body}$ in our Landman inspired lexical representations), which, as is commonly assumed (e.g. [2] and references therein), includes singularities in its extension. But this also means that the denotation of *könyv*-like ('book') nouns in Hungarian can be assimilated to that of count nouns, meaning the nominal system has less ambiguity and is therefore simpler. We follow [3] in assuming that plural nouns denote either a semi-lattice or a semi-lattice minus its atoms—i.e. is either inclusive or exclusive–depending on a set of pragmatic constraints on the context in which the plural occurs.

    The claim that singular nouns are number neutral explains why they are singular in measure phrases, with numerals, and in other environments in which languages like English use plurals. One major implication of our proposal is that Hungarian patterns with English, rather than with Brazilian Portuguese (as analyzed by [12]), when it comes to the distribution of nouns across countability classes—namely, a substantial number of mass and count nouns, but few dual life nouns—and therefore shifts the typological classification of Hungarian.

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