BABEȘ-BOLYAI UNIVERSITY
FACULTY OF LETTERS
DOCTORAL SCHOOL OF LITERARY AND LINGUISTIC STUDIES

DOCTORAL DISSERTATION

COUNTABILITY DISTINCTIONS AND NUMBER-MARKING ACROSS LANGUAGES. A CASE STUDY ON HUNGARIAN

– ABSTRACT –

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CLUJ-NAPOCA
2023

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KEYWORDS: bare nouns; classifier optionality; count/mass distinction; countability; formal semantics; generative grammar; Hungarian; kind-reference; linguistic typology; number semantics; number-marking; number-marking languages; numeral classifier languages; numeral classifiers; numeral-noun constructions; numerals; plurality; singular/plural opposition; syntax-semantics interface; the category of number.

ABSTRACT

Entities surrounding us in our everyday lives can be categorised into two broad conceptual categories: (i) countable entities – such as *table, chair, book* etc. -, which refer to discrete, individual objects; and (ii) uncountable entities – such as *water, gold, flour* etc. –, which, in contrast to entities from the previous class, do not have stable spatio-temporal boundaries and therefore disallow counting. Even though the distinction between countable and uncountable entities in the real world seems to be deeply ingrained in our very nature, the way in which languages of the world encode and reflect this distinction has puzzled linguists for decades. In other words, while the distinction between *countable* and *uncountable* real-world entities seems to be a trivial matter for most native speakers of a language, the way(s) in which this distinction is reflected at the semantic and morpho-syntactic level is subject to both intra- and inter-linguistic variation. The present thesis is dedicated to discussing and analysing these issues from a cross-linguistic perspective, with the aim of formulating a comprehensive theory of countability and number-marking across languages, taking into account the semantics and syntax of count and mass nouns, the distribution and interpretation of bare nouns across languages, the function and use of numeral classifiers as well as the various types of number-marking patterns found across languages, with special focus on Hungarian.

The motivation for choosing Hungarian as the focus of inquiry comes from the fact that Hungarian is a language that shows an interesting mix of properties insofar as the above-mentioned aspects related to countability and number-marking are concerned. Thus, traditional analyses (see Greenberg, 1984; Chierchia, 1998a,b, 2010) typically distinguish two main types of languages based on how they encode and reflect grammatical countability. On the one hand, there are the so-called *number-marking* or *mass/count* languages, such as English, German or Romanian, where most nouns can be categorised either as count or mass, where a morphological marker of plurality exists that reliably distinguishes singular nouns from plural ones, where numerals can directly modify count, but not mass nouns, and where a determiner is required to allow singular count nouns to appear in argument positions. On the other hand, there are so-called *numeral classifier languages*, such as Mandarin Chinese or Japanese, which do not distinguish count nouns from mass ones at the lexical level, generally lack a morphological marker of plurality, require the obligatory presence of a numeral classifier in both counting and measuring contexts, and freely allow bare nouns to appear in argument positions.

Hungarian seems to contradict this widely accepted typology, displaying a mixture of properties characterising both typical number-marking and numeral classifier languages. In this sense, Hungarian patterns with other number-marking languages in having a productive plural marker that morphologically distinguishes singular and plural forms of nouns, it shows signs of an underlying lexical count / mass distinction (Schvarcz, 2014; Schvarcz & Rothstein, 2017) and allows count nouns to be directly modified by numerals. But apart from the above-mentioned features, Hungarian also shares a number of properties with obligatory numeral classifier languages, such as Mandarin Chinese or Japanese. Thus, Hungarian has been shown to have a considerable number of optionally used sortal numeral classifiers (Beckwith, 1992, 2007; Csirmaz & Dékány, 2014; Szabó & Tóth, 2018), which select nouns according to shape and size, as well as a general numeral classifier *darab* ('item / piece'), which imposes no selectional restrictions on the nouns it combines with and can replace more specific numeral classifiers. Moreover, similarly to the behaviour of bare nouns in obligatory numeral classifier languages, Hungarian also allows bare, notionally count singular nouns to appear in argument positions, but the interpretation and distribution of bare nouns seems to be much more limited than what one would normally expect to find in the case of typical obligatory numeral classifier languages.

The heterogeneous properties characterising Hungarian, as discussed above, pose a challenge to traditional typologies and analyses concerning the semantics and syntax of count and mass nouns, the function of numeral classifiers, as well as the denotation of bare nouns, plurality and number-marking in general. And while both number-marking and obligatory numeral classifier languages have been subject to rigorous scientific study in the past few decades, the class of languages that use numeral classifiers optionally has remained a relatively understudied area of linguistics. The present dissertation aims to fill this gap by investigating many of the questions that were either neglected, superficially treated or left untreated in the literature. Focusing on the problematic Hungarian data, and contrasting it with the existing analyses and trends in the literature, the thesis aims not only to shed light on issues related to countability and plurality in Hungarian, but also contribute to gaining a deeper understanding of these issues from a cross-linguistic perspective, thus contributing to formulating a more refined theory of number-marking and countability across languages.

The thesis is organised into six chapters, each dedicated to a separate issue within the broader frame of the topic. Each chapter has been written so it can be read more or less

independently, while the theoretical background is presented at the beginning of each chapter, as well as on an as-needed-basis.

Chapter 1 provides a general introduction to the topic of the dissertation, aiming to outline the main theoretical challenges that motivated the choice of the topic. After a brief introduction and description of the main aims and scope of the thesis, the chapter also offers some preliminary data regarding the Hungarian nominal system, along with a general overview of the structure of the thesis.

Chapter 2 addresses several challenges associated with establishing a proper theoretical basis for distinguishing count and mass nouns across languages, both from a semantic and syntactic perspective. After reviewing the main theoretical challenges associated with establishing a proper semantic and syntactic basis for explaining the observed differences between count and mass nouns across languages, issues pertaining to the Hungarian count / mass phenomena are evaluated in greater depth. Relying on Schvarcz & Rothstein's (2017) observations regarding the differences between count and mass nouns in Hungarian, we concur with the authors in assuming that the distinction is indeed relevant in Hungarian. But at the same time, relying on a number of semantic and syntactic arguments, we show that neither a purely semantic, nor a purely syntactic account can adequately capture the full range of empirical data (*pace* Csirmaz & Dékány, 2014; Dékány, 2011, 2021; Erbach et al., 2019). Instead, we propose that a slightly adapted version of a hybrid model, in the vein of the theory proposed by Bale & Barner (2009, 2012) is more suitable for explaining the puzzling Hungarian data.

Crucial to the proposed analysis is the assumption that root nouns across languages can have denotation in three, semantically distinct domains, but that none of these domains allows, in and of itself, counting operations to take place, following Bale & Barner's (2009, 2012) theory of count and mass. Instead, in order to mark a noun as count or mass in syntax, the use of an appropriate functional head is needed, as follows: (i) the count functional head, represented formally by IND is responsible for deriving count nouns from root denotations in either limited or continuous semi-lattices; and (ii) the mass functional head, assumed to be a simple identity function that passes on the original denotation of the root noun and makes it visible to syntactic operations. This view, although sharing certain assumptions with Borer's (2005) theory of count and mass, differs from it in assuming variation in root noun denotations across languages, which, we believe, allows us to better explain the differences between the readings associated with count, mass, respectively object mass nouns across languages.

Having argued that a theory of count and mass along the lines proposed by Bale & Barner (2009, 2012) is the most suitable for Hungarian, we then turned to analysing the denotation of Hungarian root nouns, especially in light of the claims made by Schvarcz & Rothstein (2017), according to whom the denotation of the mass counterpart of a flexible noun-pair in Hungarian corresponds to the denotation that object mass nouns in English have. Nevertheless, on the basis of interpretational differences between so-called 'flexible nouns' in Hungarian and object mass nouns in English, we have shown that the two differ in significant ways, and argued that Hungarian has no, or only few object mass nouns. Consequently, we proposed that most nouns in Hungarian have denotation in either limited or continuous semi-lattices, while only a small portion of nominals in the language have denotation in individuated semi-lattices, the latter being associated with the root noun denotation that object mass nouns in English have. Next, in line with Bale & Barner's (2009, 2012) theory, we proposed that nouns become count in grammar through the use of the IND function, which remaps – albeit ambiguously – root denotations in limited and continuous semi-lattices to individuated semi-lattices. Investigating the Hungarian data in more detail and examining how the proposed analysis could be extended to include numeral classifiers as well, we further hypothesised that the IND function might not work in the same way across all languages, raising the possibility that at least in certain languages, an additional count functional head exists, labelled CLS, assumed to be realised overtly through the use of numeral classifiers.

The proposed analysis shares certain assumptions with the analysis put forward by Borer (2005) as well as by Schvarcz & Rothstein (2017). Thus, similarly to Borer's (2005) analysis, we concurred with the view that nouns are not in and of themselves able to appear in count syntax – being in this sense akin to mass –, but relying on Bale & Barner's (2009, 2012) observations, we proposed that despite this fact, not all mass nouns are interpreted in the same way. More precisely, assuming that the denotation of root nouns varies both within and across languages, we can better capture the interpretational differences observed between different types of nouns in natural languages. Furthermore, the analysis presented in Chapter 2 also shares certain insights with the proposal made by Schvarcz & Rothstein (2017) in recognising the existence of a somewhat laxed differentiation between count and mass readings of nominals in Hungarian, but at the same time it differs from it in two crucial ways: (i) under the analysis developed here, there is no need to assume variation in the function associated with count and mass functional heads across languages, instead, they can be treated in an analogous way, as long as they are realised by the same functional head (IND, respectively CLS); and (ii) there is no need to assume that mass-denoting nouns are always interpreted as kinds, which allows for

a much more straightforward explanation for the behaviour of bare nominals in languages such as Hungarian, where mass nouns do not seem to be able to refer to kinds directly.

In the next chapter, Chapter 3, we addressed issues related to the behaviour of bare singular, plural and mass nouns, with special focus on how cross-linguistic variation in terms of the distribution and interpretation of such nominals can inform the parametrisation of languages, especially in relation to the category of number and countability in general. The main motivation underlying such an analysis is given by the fact that bare nouns have been consistently shown to behave differently across languages, both in terms of interpretation and distribution, while such differences have often been linked either to the count / mass status of the respective nominals or, in more generic terms, to the way in which the category of number is expressed. In order to explain the observed cross-linguistic variation, we first reviewed three of the most well-known parameters formulated in the literature, i.e., the 'Nominal Mapping Parameter' as proposed by Chierchia (1998a,b), the 'Free Agreement Parameter' as formulated by Schmitt & Munn (1999, 2002) and Munn & Schmitt (2005) as well as the 'Plural Parameter' as described by Deprez (2001, 2003, 2005), after which we turned to examining the distribution and interpretation of Hungarian bare singular count, plural and mass nouns.

The main challenge posed by Hungarian bare nouns represents the fact that despite the fact that both notionally count singular, plural and mass nouns can be used as arguments in certain contexts without an accompanying determiner, as one would expect in the case of obligatory numeral classifier languages, neither of them seems to be able to refer to kinds directly. In this sense Hungarian has been shown to differ significantly from both obligatory numeral classifier languages – such as Mandarin Chinese or Japanese –, where bare nouns can freely appear in argument positions and refer to kinds, and typical number-marking languages such as English, where bare plural and mass terms, but not bare singular count nouns can be used to indicate kind-reference.

Contrasting our analysis with the parametric theories discussed in earlier parts of the chapter, we have shown that none of them is able to fully capture the interpretational and distributional properties of bare nominals in Hungarian. Based on these observations and by analysing the distribution and interpretation of bare singular, plural and mass nouns in various contexts in the language, we argued that nouns in Hungarian are essentially predicative in nature, while in order to turn them into arguments the presence of an overt or covert D-layer is needed. In line with this proposal, we have also investigated certain contexts discussed in Schvarcz & Rothstein (2017), Schvarcz (2018) and Schvarcz & Nemes (2021), where bare nouns, in certain cases even bare singular count nouns, have been shown to be interpreted as

kinds. Nevertheless, following mainly the observations made by Alberti (1997) and É. Kiss (2002), we have shown that nouns in the contexts discussed by the above-mentioned authors appear in the scope of another operator – including predicate, focus, negation and contrast –, arguing that the kind-interpretation in the respective contexts can be explained by the special syntactic positions that such bare nouns occupy, as opposed to them being kind-denoting in the traditional sense of the word.

Having analysed the semantics and syntax of bare nouns as well as that of count, respectively mass nouns, in Chapter 4 of the thesis we turned to addressing questions pertaining to the function of optionally and obligatorily used numeral classifiers across languages. The main questions addressed in this chapter were: (i) What is the exact role performed by numeral classifiers, especially in the case of languages that have a well-established count/mass distinction?; (ii) How can we account for the optional vs. obligatory nature of numeral classifiers across languages?; and (iii) What is the exact nature of the relationship between numeral classifiers and plural markers, especially in the case of languages where the two elements have been shown to frequently co-occur?

After a theoretical introduction into the problems associated with numeral classifier use across languages and a brief overview of the different types of numeral classifiers identified previously in Hungarian (Beckwith, 1992, 2007; Csirmaz & Dékány, 2014; Dékány, 2011, 2021; Szabó & Tóth, 2018), we first tested whether numeral classifiers in Hungarian are rather functional – as in the case of obligatory numeral classifier languages – or more nominal in nature. Based on five morphosyntactic tests, we have shown that numeral classifiers in Hungarian show mixed properties in terms of the functional / nominal divide – even in the case of numeral classifiers belonging to the same class –, where some appear to be more nominal, while others seem to be rather functional or semi-functional in nature, reflecting in this sense an intermediary stage in the grammaticalization process between numeral classifiers in obligatory numeral classifier languages and so-called unit nouns found in number-marking languages. Numeral classifiers with the highest degree of nominality have been shown to be container classifiers, while numeral classifiers most frequently shown to be rather functional or semi-functional were those identified as sortal individuating numeral classifiers and the general numeral classifier *darab* ‘item / piece’.

In order to better understand the role and function performed by numeral classifiers across languages we next turned to examining whether numeral classifiers in a language such as Hungarian are used rather due to the semantics of numerals or that of nominals, in light of two prominent theses formulated in the literature, i.e., the *classifiers-for-numerals* and the

classifiers-for-nouns theses. Analysing the behaviour of Hungarian numeral classifiers in various contexts, and in contrast with the predictions made by the two above-mentioned theses, we have shown that in Hungarian, at least, numeral classifier use tends to be tied rather to the semantics of nouns than that of numerals, in line with Dékány (2020) and contra Erbach et al. (2019). Nevertheless, as pointed out previously by several authors as well (Dékány, 2020; Little et al., 2021), we did not exclude the possibility that some level of cross-linguistic variation exists between languages, where some could be argued to use numeral classifiers due to the deficient nature of numerals in the languages, while in others numeral classifier use would be tied to the semantics of nominals instead of that of numerals.

Next, we turned to analysing three proposals formulated earlier in the literature with the aim of explaining the optionality with which numeral classifiers are used in Hungarian. Having argued previously that numeral classifier use in Hungarian is not tied to the semantics of numerals (contra Erbach et al., 2019), we turned to discussing how well the null classifier (Csirmaz & Dékány, 2014; Dékány, 2011, 2021), respectively the noun flexibility (Schvarcz & Rothstein, 2017) accounts are able to explain the facts. First, reviewing the null classifier hypothesis, according to which all numeral constructions in Hungarian contain either an overt or a covert numeral classifier, the latter assumed to be the covert counterpart of the general numeral classifier *darab*, we have shown that there are important interpretational differences between constructions containing and those lacking overt numeral classifiers. These facts, together with the count / mass facts discussed in Chapter 2, provide evidence against the assumption that in Hungarian all numeral constructions must contain a silent numeral classifier.

Turning next to the noun flexibility analysis, we have shown that since nouns appearing in numeral-noun constructions in Hungarian are ambiguous between an object- and sub-kind reading, it is untenable to assume that the mass counterparts of flexible noun-pairs in Hungarian have a denotation similar to the denotation that object mass nouns in English have, as proposed by Schvarcz & Rothstein (2017), since the latter never allow reference to sub-kinds to be made. Nevertheless, once this possibility is eliminated, the obligatory use of numeral classifiers with the mass counterpart of a flexible noun pair loses its explanatory power, as it remains unclear why it would be possible for true mass nouns to allow direct modification by numerals giving rise to a plurality of sub-kinds or a plurality of entities reading, while the mass counterpart would strongly resist undergoing such a mass-to-count shift.

In light of these observations, we have put forward an account of numeral classifiers in Hungarian in line with the proposal made by Sağ (2019) for the Turkish general numeral classifier *tane*, according to which sortal individuating numeral classifiers in Hungarian and

the general classifier *darab* in Hungarian are best treated as overt exponents of the Card cardinality head (see Scontras, 2013, 2014) that combines with a count noun and semantically disambiguates the ambiguously derived count interpretations derived through IND. The optionality of numeral classifiers can then be explained by proposing that while languages such as English realise the card cardinality head covertly, in optional numeral classifier languages it can be realised either covertly or overtly through the use of sortal individuating numeral classifiers. Obligatory numeral classifier languages differ from both English and Hungarian/Turkish-type languages in that these languages are assumed to have fully grammaticalized numeral classifiers, i.e., numeral classifiers of the functional type, which we assumed to realise at the same time both the CLS function – turning root noun denotations in limited or continuous semi-lattices to individuated ones – and the Card cardinality head overtly. Such a view differs from the null classifier analysis in assuming that numeral classifiers are not involved in deriving count readings of an otherwise mass-denoting nominal, but rather, they serve as semantic restrictors or modifiers of an already derived count reading.

The last issue we addressed in Chapter 4 has been the relationship between numeral classifiers and plural-markers across languages, especially in light of the fact that the two elements, despite being traditionally considered to be in complementary distribution across languages (see the Sanches-Slobin-Greenberg generalisation; Borer 2005), have been shown to frequently co-occur in Hungarian. Reviewing previous theories formulated with the aim of accounting for plural-marker and numeral classifier co-occurrences in obligatory numeral classifier languages, we have argued that a similar account cannot be maintained for Hungarian, given the fact that the plural marker *-k* in Hungarian resembles genuine plural-markers found in languages such as English, instead of those found in obligatory numeral classifier languages. Furthermore, contrasting the function of plural-markers and numeral classifiers we have argued, contra Dékány (2011, 2021) and Borer (2005), that the two elements have different semantic functions and cannot be assumed to occupy the same syntactic head, which explains why they can co-occur in contexts other than ones involving numerals or quantifiers, where plural markers are blocked, due to independent reasons in Hungarian.

Chapter 5 of the thesis has been dedicated to addressing several issues related to number-marking across languages, given the fact that languages have been shown to vary to a great extent with regard to the number specification on nominals especially in the context of numerals greater than one. As such, the chapter discusses several challenges associated with establishing the semantics and syntax of singular, respectively plural-marked nominals across languages as well as some of the most pertinent theories of counting in the context of numerals.

After a brief theoretical overview, we turned to discussing the Hungarian data and reviewed several theories formulated previously in the literature with the aim of explaining the lack of plural-marking in the context of numerals in Hungarian, arguing that none of the existing theories can properly account for the Hungarian facts. Consequently, in order to explain the number-marking patterns found in Hungarian, we first analysed the interpretation of singular / morphologically unmarked, respectively plural-marked nominals in the language, and showed, based on a number of semantic and syntactic texts that morphologically singular nouns in Hungarian are also semantically singular, as opposed to being number-neutral as proposed by Farkas & de Swart (2010) and Erbach et al. (2019), while plural-marked nouns have been shown to be interpreted akin to their counterparts in English. The result of the analysis therefore provided support for the mainstream view in the literature regarding the semantics of morphologically singular, respectively plural-marked nouns across languages, according to which morphological number-marking and semantic number interpretation are negatively correlated, where, despite the fact that singular nouns are morphologically less marked, they are to be thought of as being semantically more marked.

In light of these claims, we have argued that a similar proposal to the one put forward by Bale et al. (2011a,b) for Turkish, a language showing a similar number-marking pattern to Hungarian, cannot be applied to explain the Hungarian number-marking patterns, and proposed an alternative analysis for number-marking inside numeral-noun constructions in Hungarian, building on the compositional analysis of numerals as formulated originally by Ionin & Matushansky (2006, 2018) and a presuppositional account of number-marking in the vein of Scontras (2013, 2014). More precisely, we accepted Ionin & Matushansky's theory in treating numerals as modifiers of type ⟨⟨e,t⟩,⟨e,t⟩⟩, which combine with a semantically singular, i.e. atomic predicate, arguing that the fact that languages differ with regard to the number specification on nouns in the context of numerals is the result of the different agreement settings employed by the respective languages. In other words, plural-marking on nouns in the context of numerals greater than one have been assumed to be the result of semantic concord, rather than a genuine marker of semantic plurality (see also Ionin & Matushansky, 2006, 2018; Deal, 2017; Sauerland, 2003; Sauerland et al., 2005; Scontras, 2013, 2014; Alexiadou, 2019).

Next, we extended the proposed analysis to the function and role of numeral classifiers in Hungarian, in line with the assumptions made in earlier chapters of the thesis, arguing that sortal individuating numeral classifiers and the general classifier *darab* in Hungarian combine with semantically singular count nouns – contra traditional analyses according to which

numeral classifiers modify kind-denoting, i.e., mass terms –, while their role is that of restricting the type of atoms being counted by numerals.

In light of the conclusions reached in Chapter 5 of the dissertation, we have shown that it is possible to formulate a theory of number-marking while maintaining the semantics of both singular and plural nouns as well as that of numerals relatively uniform across languages and to ascribe variation in number-marking patterns across languages to different agreement patterns, as well as to numeral classifier functions.

The final and last chapter of the thesis, Chapter, 6 offers a brief summary and discussion of the main conclusions and findings of the thesis and highlights some of the questions that were left for future research.

The main contribution of the present thesis consists in the formulation of a theory of countability and number-marking that is capable of explaining not only the puzzling Hungarian facts, but one that has the potential to be extended to both number-marking and numeral classifier languages. And while in order to formulate a fully comprehensive typology of countability and number-marking requires further inquiry and a wider cross-linguistic perspective, the proposal made in the present thesis allows us to make some preliminary observations as to what a theory along these lines would look like.

First, in line with the count/mass theory as formulated by Bale & Barner (2009, 2012), we could assume that nouns in all languages take their denotation from three, semantically different domains, but none of these domains allows, in and of itself, counting operations to take place. While such an analysis resembles Borer's (2005) theory according to which all nouns across all languages are in some sense mass, it is superior in the sense that, by introducing variation in the way atoms are defined in semi-lattices from which count and mass nouns take their denotation, it becomes easier to account for observed differences between the readings associated with notionally count, notionally mass and object mass nouns across languages. Furthermore, in order to mark nominals as count or mass, and therefore allow them to interact with count syntax, the use of functional heads would be needed, and as argued above, the range of the operators realising these functions across languages could be argued to be partly responsible for the observed differences in terms of countability and number-marking.

Thus, looking first at typical number-marking languages such as English, one could assume, that in languages of this type count readings of nominals are derived through the IND function, as proposed originally by Bale & Barner (2009, 2012), which takes a root noun having denotation in either limited or continuous semi-lattices and returns an individuated semi-lattice.

In contrast, the mass functional head would be assumed to be a simple identity function, which passes on the original denotation and makes it visible to syntax. Assuming that counting takes place on the basis of a Card head (Scontras, 2013, 2014), we could then assume that in languages like English, the μ_{CARD} cardinality head is realised covertly, allowing counting to take place on the basis of the individuals derived through the IND function.

In contrast to English-type languages, obligatory numeral classifier languages could be assumed not to have access to the IND function, and to derive count readings through an alternative function, labelled CLS for the sake of simplicity. Similarly to IND, CLS would be assumed to be responsible for deriving individuated semi-lattices from non-individuated ones, thereby marking the respective nouns as count in syntax. One could then assume that sortal individuating numeral classifiers are the overt exponents of the CLS functional head as well as the μ_{CARD} cardinality head. In this sense, obligatory numeral classifier languages would be assumed not to have access to a covert μ_{CARD} cardinality head, and therefore they would always be required in counting contexts. Such an approach would then explain, on the one hand, the similar ways in which nominals in obligatory numeral-classifier and number-marking languages are interpreted, while also accounting for the obligatoriness of numeral classifiers in a principled way.

To explain the patterns found in optional numeral classifier languages such as Hungarian or Turkish, one could assume that similarly to English, the IND functional head is available, which is responsible for deriving count nouns. Nevertheless, since the IND function can derive the individuals from non-individuated semi-lattices in ambiguous ways, the exact nature of atoms / individuals that form the basis of counting will remain somewhat vague. What makes optional numeral classifier languages different from number-marking and obligatory numeral classifier languages is the fact that in languages belonging to this class, the μ_{CARD} cardinality head will be assumed to be realised either covertly, as in English, or overtly through the use of sortal individuating numeral classifiers, as in numeral classifier languages, thereby explaining the apparent optionality of numeral classifiers in counting contexts.

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