Predicting Object Mass Nouns Across Languages

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Main Idea

The amount of object mass nouns in a language is related to the amount of morphosyntactic reflexes of the mass/count distinction in that language.

- Comparing the amount of object mass nouns (e.g. *furniture, dishware*) and the amount of morphosyntactic reflexes of the mass/count distinctions (e.g. *much furniture*, *#many dishware*) in English, Greek, Hungarian, and Japanese respectively, reveals a correlation between the two amounts in each language.
- The analysis of Sutton and Filip (2016a,b, 2018) and Filip and Sutton (2017) can be extended to Greek, Hungarian, and Japanese.
- The analyses of Chierchia (2010, 2015) and Rothstein (2010, 2017) are respectively too strong and too week for these languages.

Background

Identifying object mass nouns in English: Two key properties

1. Grammatically pattern with **mass** nouns
   - infelicitous in direct combination with numericals:
     a. two chairs, two #(pieces of) furniture, two #(pieces of) mud
   - infelicitous with plural morphology:
     b. chairs, #furnitures, #muds
   - infelicitous with count determiners
     c. many chairs, #many furniture(s), #many mud(s)
   - felicitous with mass determiners
     d. much mud, much furniture, #much chair(s)
2. Refer to **objects**
   - Can be compared in terms of cardinality (Barner and Snedeker, 2005) or associated event (Grimm and Levin, tted).
     e. Who has more furniture?
     f. Who has more mustard?
   - Can be modified by stubbornly distributive predicates like *big* and *round* (Rothstein, 2010; Schwarzschild, 2011)
     g. The furniture in our house is big. (Rothstein, 2010)
     h. ?The snow is round. (Schwarzschild, 2011)

>**13 morphosyntactic environments sensitive to countability in English**

number marking, counting construction, *a, both, each, every, few, little, many, much, several, these, those*...

>**50 Object mass nouns in English**

ammunition, apparel, armor, art, artillery, artwork, autumnwear, baggage, bakeware, beachwear, bedding, change, china, clothing, clutter, crockery, cutlery, decoration, dishware, equipment, earthenware, freight, furniture, footwear, gear, glassware, hardware, inventory, jewelry, knitwear, laundry, legwear, lingerie, loot, luggage, mail, merchandise, molt, outerwear, packaging, paperwork, plasticware, seating, shapewear, silver, silverware, software, sportswear, staff, stock, swag, teaware, tupperware, underwear, weaponry...

Crosslinguistic Investigation

Object mass nouns and countability in Greek

Tsoulas (2008) discusses two tests for the Greek mass/count distinction.
- Straightforward occurrence in the counting construction
- The count determiner *kathe* ('every')

Plural mass nouns that are true mass nouns (not portions or kinds)

(1) Trehoun **nera** apo to tavani.
Drip.3RD.PL **water.PL**.NEUT.NOM from to ceiling.NEUT.SG
'Water is dripping from the ceiling' (Tsoulas 2008 p. 133)

(2) *Dio **nera** trehun apo to tavani.
two **water.PL** run from the ceiling
'Two waters dripped from the ceiling' (Tsoulas 2008 p. 135)

(Alexiadou, 2015) argues Greek has object mass nouns.
- *epiplosi* ('furniture'), *rohismos* ('clothing')

(3) i epiplosi sto domatio ine strogili
the furniture in.the room is round
'The furniture in the room is round.' (Alexiadou, 2015, p. 14)

Object mass nouns and countability in Hungarian

Schvarcz and Rothstein (2017); Rothstein (2017) discuss three tests for the mass/count distinction in Hungarian.
- Straightforward occurrence in the counting construction
- Plural morphology
- The count determiner *hány* ('how many')

Optional sortal classifiers for counting count nouns.

(4) hét (szál) gyertya
seven CL$_{thread}$ candle
'seven candles' (Csirmaz and Dékány, 2014, p. 150)

Dual-life nouns can refer to pluralities when singular and combined with definite determiners.

(5) A követ a sétány mellett helyezt-em el.
the stone.ACC the walkway next.to place.PST-1SG.INDF aside
'I put the stone next to the walkway.' (one or several)

Object mass nouns can refer to pluralities when singular and combined with definite determiners.

(6) A lőszer 2kg-ot nyom.
the ammunition 2kg-ACC weigh
'The ammunition weighs 2 kilograms.' (e.g. one or several pieces) (Erbach et al., 2019)

- *lőszer* ('ammunition'), *felsszerelés* ('equipment'), and *csomagolás* ('packaging')

Countability in classifier Languages—e.g. Mandarin, Japanese

Classifiers are required in counting constructions (Chierchia, 1998, i.a.).

(7) a. sān qún xíong (Mandarin)
three herds bear
'three herds of bears'
b. sān zhī xíong
three CL bear
'three bears' (objects) (Krifka, 1995, pp. 398-399)

Sudo (2015) argues some Japanese nouns have countable denotations.
- Five tests: *nan-byaku to iu* ('hundreds of'), *dono* N *mo* ('every'), *tasuu* ('many'), *shoosuu* ('few'), large round numbers

Evidence for Japanese object mass nouns: countability tests from Sudo (2015) and quantity comparison (Erbach et al., 2017).

(8) #Atarashī ryōri no gakkō wa nan-byaku-to-iu chōrikigu o ka-tta.
new cooking GEN school TOP what-hundred-to-say kitchenware ACC buy-PST
#'The new culinary school bought hundreds of kitchenware.'

- *shinamono* ('wares/articles'), *kattamono* ('shopped goods'), *kagu* ('furniture'), *shokki* ('dishware'), *sōbi* ('equipment'), *dōgu* ('tools')

Discussion

The data confirms the main hypothesis: The amount of object mass nouns in a language is related to the amount of morphosyntactic reflexes of the mass/count distinction in that language.

Table 1: *Approximate Numbers: Tests versus Object Mass Nouns*

Language	Mass/Count Tests	Object Mass Nouns
English	13	50
Greek	2	2
Hungarian	4	3
Japanese	5	2-6

Object mass nouns occur among nouns that refer to aggregates of objects (Barner and Snedeker, 2005; Sutton and Filip, 2016b).

Table 2: *Countability across notional classes*

	individuals	aggregates	substances
English	*dogs*$_{[+C]}$	*furniture*$_{[-C]}$	*water*$_{[-C]}$
Greek	*skyloi*$_{[+C]}$	*epipl*⋆$_{[\pm C]}$	*nero*$_{[-C]}$
Hungarian	*kutyák*$_{[+C]}$	*bútorok*$_{[+C]}$	*víz*$_{[-C]}$
Japanese	*inu*$_{[+C]}$	*kagu*$_{[-C?]}$	*mizu*$_{[-C]}$

Analysis

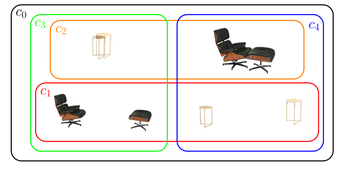
The origins of object mass nouns

- Free lexical choice: Chierchia (2010, 2015); Rothstein (2010, 2017)
  1. Chierchia (2015) In strong number marking languages only
     - The presence of object mass nouns is dependent on strong number marking.
     - Languages without this—e.g. Greek and Japanese—should have no object mass nouns.
       This does not fit with the available data
  2. Rothstein (2010, 2017) does not predict the occurrence of object mass nouns
     - Object denoting nominal predicates countable with classifiers are object mass
     - Such predicates should demonstrate uniform behavior
       This does not fit with the available data
- Restricted lexical choice: Sutton and Filip (2016b,a)
  - Nouns that are individuated and non-disjoint at the null counting schema are object mass

Sutton and Filip (2016a) countability arises from two interacting functions on predicates:

1. **IND**, the individuation function, identifies entities that can be counted.
   - Inspired by generator sets (Landman, 2011), OU function (Krifka, 1989)
2. c, a counting schema
   - A *specific counting schema*, $c_i(P)$, denotes a maximally disjoint subset of the individuals denoted by P.
     - Inspired by variants (Landman, 2011), default counting contexts (Rothstein, 2010)
   - The *null counting schema*, $c_0(P)$, denotes all, possibly overlapping individuals denoted by P.
     - Inspired by contexts for object mass Ns in Landman (2011)

- Predicates like $furniture$ are placeholders for bundles of bundle of perceptual, functional, and topological properties.
- The **IND** function identifies potentially countable individuals—e.g. coffee tables, chairs, ottomans, and ottoman+chair pairs.



- Collective artifact Ns interpreted at c_0 are not countable—i.e. mass, e.g. *furniture*
- Collective artifact Ns interpreted at a specific counting context, c_i, are count, e.g. *meubel* ('(piece of) furniture', Dutch)
- The distinction between substances and objects is reflected in the lexical entries of Ns
  - Pre-linguistic infants can distinguish substances from objects (Soja et al., 1991).
  - Formally, there is no **IND** function in the lexical entries for substance denoting Ns.
- The * operation is the upward closure of individuals under sum. ${}^*P = \{y : \exists X \subseteq P : y = \sqcup X\}$

The countability of aggregate nouns depends on the counting schema.
- *bútorok* ('furniture' Hungarian), interpreted at a specific counting schema (c_i), is count (9a).
- *furniture* is interpreted at the null counting schema (c_0) so it is mass (9b).

(9a) $[\![\textit{bútorok}]\!]^{c_i} = \lambda x.\langle c_i(\textbf{IND}(\text{FURNITURE}))(x),\ \lambda y.c_i(\textbf{IND}(\text{FURNITURE}))(y)\rangle$

(9b) $[\![\textit{furniture}]\!]^{c_i} = \lambda x.\langle {}^*c_0(\textbf{IND}(\text{FURNITURE}))(x),\ \lambda y.c_0(\textbf{IND}(\text{FURNITURE}))(y)\rangle$

Conclusion

Further work is needed to determine why the amount of object mass nouns in a language is related to the amount of morphosyntactic reflexes of the mass/count distinction in that language.

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