COUNTING IN CONTEXT

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Abstract

MAIN THESIS: A major factor that grounds the mass/count distinction is the (non-)resolution of overlap in context.

MAIN ARGUMENTS: (i) Counting presupposes that Ns be interpreted relative to counting contexts, which are contexts enforcing a resolution of overlap in N denotations (following some suggestions in Rothstein (2010) and Landman (2011)); (ii) There is a typal difference between mass and count Ns (in line with Krifka (1989); Rothstein (2010)); lexical entries of mass Ns specify the null context as the context for evaluation, and because it allows for overlap in their denotations, it makes them uncountable; in contrast, lexical entries of count Ns do not specify such a context, and therefore their counting context may vary from utterance to utterance. Adopting this semantics has two major benefits:

(i) Predict on semantic grounds, for a large class of Ns, when we can(not) expect to find mass/count variation cross- and intralinguistically.

(ii) Explain why superordinate object mass Ns resist mass-to-count coercion.

Background: Data

Signature Property of Mass Nouns

Mass nouns cannot be directly modified by numerals, baring coercion:

(1) ?Billie has three muds/rices.
coercion
(a) portion: "three bowls of rice";
(b) subkind: "wild rice", "long-grain rice", and "arborio rice".

Count nouns can be directly modified by numerals, without coercion:

(2) Alex has three cats/chairs/cars.

Divergent Mass-to-Count Coercion Patterns

Object mass nouns (*furniture, kitchenware, silverware*) RESIST MASS-TO-COUNT COERCION:

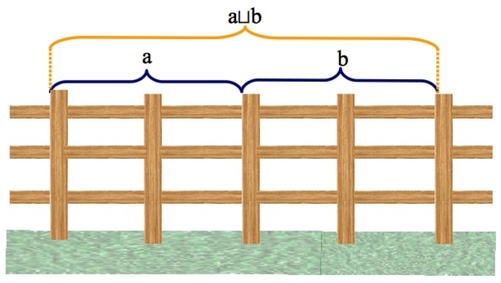
MASS-TO-COUNT COERCION
(3) ? Can you bring three furnitures to our office, please?
Not, e.g.: "Can you bring two chairs and a table to our office, please?"

or

MASS-TO-SUBKIND COERCION
(4) a. ?? I ordered three furnitures: chairs tables and cabinets.
b. ?? I ordered three furnitures: kitchen, living room, and office.

Background: Previous relevant work

Rothstein (2010)



- Mass nouns of type $\langle e, t\rangle$
- Count nouns of type $\langle\langle e \times k\rangle, t\rangle$ indexed to counting contexts: e.g.,
  - In context k_1: $|\{\langle a, k_1\rangle, \langle b, k_1\rangle\}| = 2$ (two fences)
  - In context k_2: $|\{\langle a \sqcup b, k_1\rangle\}| = 1$ (one fence)
- Counting is counting entity-context pairs

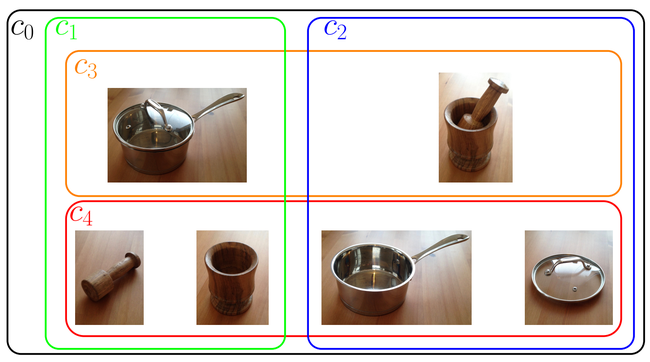
Landman (2011)

- For object mass nouns (Landman's "neat" mass Ns), generator sets = entities that count as 'one': e.g., $\mathbf{gen}(\text{KITCHENWARE}) = \{\text{teacup}, \text{saucer}, \text{teacup} \sqcup \text{saucer}, \text{pestle}, \text{mortar}, \text{pestle} \sqcup \text{mortar}\}$
- Overlapping entities count as 'one' SIMULTANEOUSLY IN THE SAME CONTEXT
- Different maximally disjoint subsets ("variants") yield different cardinalities
  ⇒ COUNTING GOES WRONG

Analysis: Rothstein-Landman Synthesis

Rothstein's Contexts: $c_{i>0} \in \mathcal{C}$
In 'default' cases, map overlapping entities ↦ disjoint set

Landman's Contexts: c_0
Allows overlap in the same context.



Interdefinability

- The union of the interpretations across all $c_{i>0}$ is the interpretation at c_0

$$[\![\phi]\!]^{c_0} = \bigcup [\![\phi]\!]^{c_i} \text{ for all } c_{i>0} \in \mathcal{C}$$

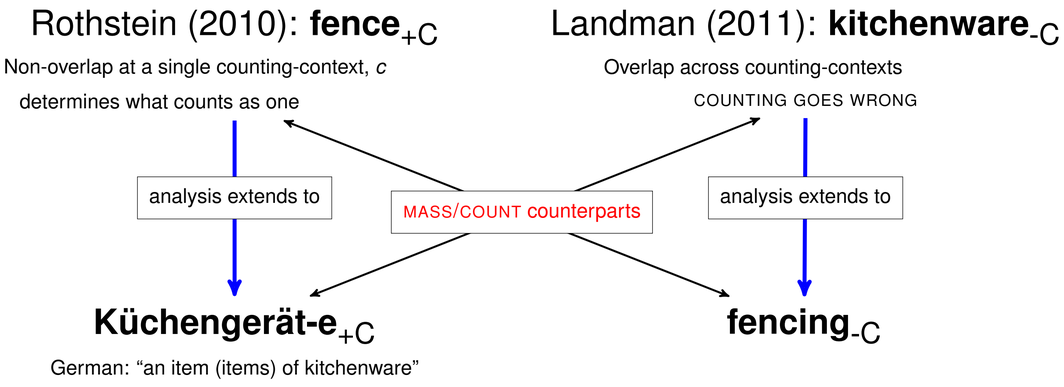
- Restriction on Counting Contexts: Always Maximally Disjoint subsets

$$X_{c_i} = \{Y : Y \subseteq X, \text{ for all } x, y \in Y, x \sqcap y = \varnothing \text{ and for all } x \in X \text{ and some } y \in Y, x \sqcap y \neq \varnothing\}$$

- Null Counting Context computed from all others:

$$X_{c_0} = \bigcup X_{c_{i>0}} \text{ computed from all } c_i \in \mathcal{C}$$

Extending empirical coverage via Rothstein-Landman synthesis



Proposal: Counting in Context

The IND function

We assume $\mathbf{IND} : \langle\langle e, t\rangle, \langle c, \langle e, t\rangle\rangle\rangle$

- When N denotes individuals (*cat, lentils, furniture, fence*):
  - Returns set of entities that intuitively count as 'one'
- When N does not denote individuals (*mud, blood, air*):
  - Returns the empty set

The mass/count distinction in terms of disjointness:

Mass Ns are SATURATED WITH THE NULL CONTEXT

- Count Ns interpreted at context of utterance c_i
- Mass Ns interpreted at null context c_0

- N is MASS: $[\![\text{N}]\!]^{c_i} = [\![\text{N}]\!]^{c_0}$ for all $c_i \in \mathcal{C}$, and $\mathbf{IND}(N)_{c_0}$ is not disjoint or empty.
- N is COUNT: $\mathbf{IND}(N)_{c_i}$ is disjoint in Rothstein's counting contexts

Ns interpreted relative to a number neutral property and a counting base:

$[\![\text{cat}]\!]^{c_i} = \langle \text{CAT}, \mathbf{IND}(\text{CAT})_{c_i}\rangle$

$[\![\text{kitchenware}]\!]^{c_i} = \langle \text{K\_WARE}, \mathbf{IND}(\text{K\_WARE})_{c_0}\rangle$
$[\![\text{fencing}]\!]^{c_i} = \langle \text{FENCE}, \mathbf{IND}(\text{FENCE})_{c_0}\rangle$

$[\![\text{Küchengerät}]\!]^{c_i} = \langle \text{K\_WARE}, \mathbf{IND}(\text{K\_WARE})_{c_i}\rangle$
$[\![\text{fence}]\!]^{c_i} = \langle \text{FENCE}, \mathbf{IND}(\text{FENCE})_{c_i}\rangle$

$[\![\text{mud}]\!]^{c_i} = \langle \text{MUD}, \mathbf{IND}(\text{MUD})_{c_0}\rangle$

- Disjoint, non-empty IND-sets ⇒ at c_i or c_0, always COUNT
- Non-disjoint, non-empty IND-sets ⇒ MASS at c_0
- Non-disjoint, non-empty IND-sets ⇒ COUNT at c_i
- Empty IND-sets ⇒ at c_i or c_0, always MASS

- Disjointness and/or Emptiness of IND-sets ⇒ Stably Count/Stably Mass
- Non-Disjointness of IND-sets ⇒ Mass/Count variation

Proposal: Predictions for Mass-to-Count Coercion

General process for mass-to-count coercion

- Replacement of $\mathbf{IND}$ with $\mathbf{CL}$, a conventionalized, salient unit or measure.

$$\langle P, \mathbf{IND}(P)_c\rangle \mapsto \langle P, \mathbf{CL}(P)_c\rangle$$

Examples

- Conventionalized, salient unit or measure for *water*, e.g., $\mathbf{BOTTLE}$ *of water*.
  - If container reading, then disjoint, and therefore disjoint at c_0
- Also for *Granular* mass Ns (e.g. *rice*) with CL, e.g., $\mathbf{BOWL}$ *of rice*.
- BUT: For Object mass Ns (*kitchenware, furniture*), conventionalized, salient unit or measure (e.g. *item*) amounts to the identity $\mathbf{IND} = \mathbf{CL}$
  - ONLY DISJOINT AT A SPECIFIC COUNTING CONTEXT!
  - Not disjoint at c_0.
  - Different cardinalities at different counting contexts ⇒ COUNTING GOES WORNG

$[\![\text{water}_{\text{coerced}}]\!]^{c_i} = \langle \text{WATER}, \mathbf{BOTTLE}(\text{WATER})_{c_0}\rangle$ - Disjoint ∴ COUNT

$[\![\text{rice}_{\text{coerced}}]\!]^{c_i} = \langle \text{RICE}, \mathbf{BOWL}(\text{RICE})_{c_0}\rangle$ - Disjoint ∴ COUNT

$[\![\text{kitchenware}_{\text{coerced}}]\!]^{c_i} = \langle \text{K\_WARE}, \mathbf{IND}(\text{K\_WARE})_{c_0}\rangle$ - Not-disjoint ∴ MASS

- Disjointness of CL-sets ⇒ Mass-to-Count Coercion
- When IND=CL, non-Disjointness of IND-sets ⇒ Coercion blocked

Conclusion and Extensions

Puzzle for *Granulars*

- But the general account does not predict *rice* to be mass or mass/count variation (*rice* vs. *lentils*).
  - Single lentils/rice grains don't overlap ⇒ $\mathbf{IND}(\text{RICE})/\mathbf{IND}(\text{LENTIL})$ is disjoint.
  - BUT, disjointness of IND set wrongly predicts stable count encoding
- Need to add e.g. a Vagueness story (Chierchia, 2010).
- Solution to the puzzle in Sutton and Filip (2015, 2016)

Assume IND as pretheoretical

- More details in forthcoming work... Watch this space!

Selected References

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