

Philosophy of Mathematics Seminar

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Metaphysics First or Language First: The Notion of a Single Object

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1. Outline of the talk

1.1. Background: The relation between language and reality

The older, naïve view

Language reflects reality, is a guide to ontology.

Later views

Discrepancy between language and reality; language is not a guide to ontology.

Philosophers' loss of interest in language: language does not 'carve nature at its joints'.

Chomsky's skepticism regarding reference: natural language does not involve reference to real objects

Presupposition:

- Reality is (mainly) mind-independent physical reality
- Entities are subject to standard conditions of individuation:

Single location in space at a time, consistency of property attribution

More recent approaches

[1] The metaphysics-first view (Peacocke 2019)

Metaphysics of a domain is involved in the explanation of the nature of the meaning of sentences in that domain.

[2] The language-first view

Reality is shaped by our linguistic access to it (roughly).

(Neo)Fregean notion of an object

An object is what a singular term may stand for.

Linguistic idealism (Gaskin 2020):

Reality is shaped by linguistic structure throughout.

1.2. The topic of the talk

The notion of a single object, of being ‘one’, is important for philosophy of mathematics in that it is presupposed by any account of the notion of number.

The Fregean definition does not give the notion of a *single object*, and the notion of an *object* needs to be distinguished from the notion of a *single object*.

What criterion is there for the notion of a single object?

Ultimately only (again) linguistic criteria: the use of a singular count noun or classifier.

Fact

The application of the singular count category as such requires no substantial conditions for the objects of reference.

Unity can be imposed or withdrawn through language, not subject to general conditions.

Tentative conclusion

Linguistic idealism is quite plausible for the notion of a single object, especially given the linguistic facts about the mass-count distinction

Caveat

The linguistic facts are actually more complex, displaying multiple layers of the absence or presence of single objecthood.

Distinguish between *conceptually driven* and *syntactically driven oneness*.

2. More recent views regarding a discrepancy between language and reality

2.1. Natural language fails to be a guide to ontology

Natural language reflects an implausibly rich ontology, including shadow, holes, possible and nonexistent objects.

Possible response: allow reality to contain ontologically dependent, derivative, mind-dependent entities.

2.2. Chomsky’s skepticism regarding referential semantics

Referential NPs generally do not stand for objects in a mind-independent world meeting standard conditions on individuation

Various cases of co-predication of apparent inconsistent property attributions

Example:

(1) The book is heavy and interesting.

A common view:

Books are not single objects, but divide into content and material copies.

Response to Chomsky's skepticism

Conceive of the semantic values of referential NPs as objects not meeting standard conditions of individuation, for example in terms of Fine's (1999, 2020) notion of a variable embodiment:

A variable embodiment d comes with a function f from times to manifestations.

A book as a variable embodiment comes with a function from times to concrete copies

The concrete copies still have a content and material constitution

Additional argument for reference to 'single' objects:

The alleged non-objects permitting apparently inconsistent co-predications generally permit predicates that cannot hold of what they divide into:

(2) The book appeared last year.

Material objects do not 'appear' in the same sense, contents do not 'appear'.

Artifacts may come with material realizations and typically have also properties that are not properties of pure contents or purely material objects.

2. The notion of an object

Frege's notion of an object (updated)

An object is what a referential NP may stand for.

Criteria for referential NPs:

Referential NP – well-established in linguistics

Refinements:

Referential NPs, with certain types of predicates (existence-entailing predicates)

Also nonspecial anaphora, quantifiers: *it, every N*

Not special pronouns or quantifiers *that, the same thing, everything*

The Fregean criterion defines objects, but not single objects.

Semantic values of definite mass and plural NPs come out as objects as well.

(3) a. The house is on fire.

b. The students collaborate.

c. The water is in the bottle.

3. The notion of a single object

Standard semantic treatment of plural and mass NPs:

Extensional mereology, with its division into three domains and here different part relations.

The domain of individuals: $\langle D, \langle i \rangle, \langle_i \rangle$ individual part relation

The domain of pluralities: $\langle \text{SUM}_{\langle p \rangle}(D), \langle p \rangle, \langle p \rangle$ plural-specific part relation

The mass domain: $\langle M, \langle_m \rangle, \langle_m \rangle$ mass-specific part relation

Use of individual variables in all cases:

Treatment of pluralities and quantities as single entities in the metalanguage

But the semantic values of definite plural and mass NPs do not behave as single objects': they do not count as one.

What is a single object?

An object that is 'one' or a single object and thus that can be counted

Linguistic correlate: singular count noun

Criteria for singular count nouns

Generally come with the plural

Applicability of cardinal and ordinal numerals, *number*-phrases

(4) a. the first house, one house, a number of houses, * an amount of houses

b. *the first wood, *one wood, *a number of wood, ok an amount of wood

Number-related predicates

(5) a. Joe is *one of* the children at this school.

b. The students are *numerous*.

Syntactic or semantic selection?

Predicates of counting, ranking (cardinal and ordinal number-related actions)

(6) a. John counted / ranked the students.

b. ?? John counted / ranked the wood.

c. John counted ??? the orchestra / ?? the class.

d. ??? John ranked the orchestra / the class. (on the internal reading)

Existence predicates

(7) a. The buildings do not exist.

b. The set / sum / collection / fusion of the buildings does not exist.

(8) a. The rice does not exist.

b. The portion / quantity of the rice does not exist.

(7b, 8b) can be used to deny the existence of sets, sums, collections, portions, quantities, but not so (7a, 8a).

Existence predicates show that the distinction between singular count – plural / mass is truly a semantic distinction!

Is being a single object a condition that certain objects can fulfill, but not others?

Does being single thing consist in permitting reidentification?

(9) a. This is the same gold that that we looked at yesterday.

b. This is the same piece / amount of gold that we looked at yesterday.

c. The very same material was used for the chair and then then later for the table.

Kind reading and portion reading (though harder to get)

Being a single thing = being referred to by a singular count NP:

Is there a semantic content to the category of singular count nouns?

Two approaches to the notion of a single object / the content of count nouns

[1] The extensional mereological approach:

(10) x is a single object = x is an atom relative to a concept / noun (for a concept C,

C(x) and for no y, $y < x$, C(y))

The problem

Sequence-type nouns: *sequence, line, quantity, portion, sum, entity, surface, wall, fence*

Collection nouns: *collection, sum, group,*

Portion nouns: *portion, quantity, amount*

Entity nouns: *entity, being, thing*

Observation

Ordinarily in definite NPs with such a noun as head are used in contexts in which they refer to a unique (often maximal) object in the context

- (11) a. The sequence he wrote down,
 b. The fence he had built is white.
 c. The portion of wine in the bottle is small.

A proposal in the literature (Rothstein 2017)

Relativize count nouns to a contextually given set, relativize atomicity to that set

Fact

The nouns can also be used so as not to describe atoms relative to a set:

Mathematical contexts:

() Strictly speaking, there are infinitely many lines, portions, quantities, surfaces, entities in front of you.

Natural language does not exclude such uses!

[2] The integrity-based approach to the notion of a single object

Being one = having a form, boundary, being an integrated whole (of some sort)

A similar problem:

- (12) a. the sum of this pen and the Eiffel Tower
 b. the lower half portion of the water in the glass.
 c. the quantity of wood from which this chair and that table are made

What about the 'form' of variable embodiments?

Observation: also mass NPs can stand for variable embodiments: faculty, medical staff,

- (13) The faculty / medical staff has increased.

Countability tied to concept?

Clothes – clothing, shoes - footwear

Police, police force, police man

Faculty – faculty members, professors

Clothes – clothing, shoes - footwear

Conclusion

For referring to something x as ‘one thing’, x need not fulfill any conditions of integrity or atomicity whatsoever. Anything can be conceived or referred to as a single thing.

Similarly, any plurality of however well-individuated things can be referred to as a mere ‘quantity’ with a suitable mass noun.

The use of a singular count noun suffices for picking something out as a single thing or defining something as a single thing.

A linguistic construction clearly introducing unity, rather than picking up units–thing-quantifiers

(14) a. John thought of only *one thing*, his children.

b. John forgot *two things*: the water and the wine.

c. Joe ate only *two things*, the peas and the nuts.

A linguistic construction dissolving unity: adnominal whole

Whole can dissolve unity (Moltmann2005)

(15) a. The whole collection is expensive.

b. The collection is expensive.

A view of linguistic idealism about unity conveyed by singular count nouns:

Referring to something as a single thing does not mean referring to something through a property of being one, but introducing something as a single thing.

Linguistic fact

Alternative to singular count nouns in some languages with or without syntactic mass-count distinction among nouns: individuating classifiers

Chinese, English *piece of cattle, amount of wine*

Generalization

Being one does not require any constitutive conditions, but it often does go along with them.
Constitutive conditions do not guarantee oneness.

Integrity does play a role, though, semantically:

[1] The conversion of mass nouns to count nouns.

Apple (count noun) → *apple* (mass noun):

(16) many apples - more apple

[2] The meaning of *time* as a classifiers for events, individuating maximal temporally continuous states / activities

(17) a. John slept a few times today.

b. Joe lived in Paris a few times in his life.

[3] Unity through the use of descriptions

(18) John ate the chocolate and the honey. He ate them / both quickly.

5. Consequences for formal semantics

What does the distinction between objects that are one, objects that are many, and objects that are neither one nor many mean for formal semantics?

Plural NPs

Plural reference, plural logic (McKay 2016, Oliver/Smiley 2013): use plural variables 'xx' as distinct from individual variables 'x'; pluralities also in the metalanguage

Identity and existential quantification applicable to plural variables

Identity strictly based on identity of individual members of plurality.

Mass NPs

Much less formal work (but see McKay 2017)

Variables for 'quantities', but as neither one nor many

Mass reference also in the metalanguage.

Identity based on identity of parts (but not for variable embodiments!)

Tentative conclusions

The notion of a single object is not grounded in reality, but in language / the mind:
uses of count nouns and classifiers introduce unity; they do not pick it up.

The mass-count distinction displays ‘grammaticized individuation’ (Rothstein 2016),
language-driven (level of) ontology (Moltmann 2020).

A particularly good case for linguistic idealism (Gaskin 2020)

6. Complications: multiple levels

The picture so far

Count noun uses and uses of classifiers set up entities as single things, in part, but not always based on conditions of integrity.

The observation:

Natural language semantics displays not just a single level of language-driven ontology, but multiple levels, allowing speakers to go back and forth between unity and non-unity.

Example 1:

Object mass nouns: *furniture, police force, faculty*

Countability:

No application of numerals

(19) a. * many furniture, police force

b. * The furniture is numerous.

But:

Marginal applicability of predicates of counting:

(20) John counted the furniture / the police force.

Quantitative comparison based on counting individuals

(21) There is more furniture in this room than in that room.

Example 2:

Both, German beides

(22) a. Hans trank das Wasser und den Wein. Er hat das (sing.) beides (sing.) schnell
getrunken.

b. John drank the water und the wine. He drank both quickly.

Distinguish different levels of language

The grammatical-conceptual divide (Copley/Roy2022):

Individuation at the conceptual and the lexical level

Unity at two levels

Concept-driven unity: application of predicates like *count*, quantitative comparison, application of German *beides*

Syntax-driven unity; application of numerals, *numerous*, *is one of them*

Conceptual meaning: may be connected to unity

Object mass nouns: function overall quality overrides individual unity

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