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Reference and Sortals

Friederike Moltmann

fmoltmann@univ-paris1.fr

semantics@univ-paris1.fr

1. On Sortals

Common view: nouns coincide with sortal predicates

What is characterizes sortals? Sortals provide a criteria of identity

sortals tell us

- when two entities at a time are the same
- when two entities at different times are the same (conditions of persistence)
- when two entities in different possible circumstances, different possible worlds are the same

Definition of a Sortal (Stanford Encyclopedia)

- (2) a. A predicate F is a sortal iff F provides a criterion of identity (at a time, over time, across worlds)
- b. A set of properties K is a criterion of identity provided by a sortal F iff for any two entities a and b, which are both F, if a and b agree in all properties in K, then a and b are identical.

what does a criterion of identity actually apply to:

- names of an object
- perceptual representation of an object
- temporal stages of an object
- the object itself

2. Views on the relation of reference and sortals

2.1. Standard view:

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Referential terms refer to objects, predicates apply to objects

Are sortals necessary for reference, and why should that be so?

Sortal-free definite descriptions:

(1) *what John saw*

- a house, a wall, the surface of the wall, the whiteness of the wall

the free relative clause is incomplete as a definite description

2.2. An older philosophical view: Geach

Reference requires a sortal: a sortal that gives identity conditions for the object referred to
sortal predicates divide the world into various equivalence classes

Reference is sortal-relative, more precisely, it is sortal-relative when making reference to an entity with criterion of identity associated with it

name of an object: refers to entity without criterion of identity

name for an object: refers to entity with criterion of identity

Ordinary proper names: involve implicit sortal, are names for an object

two kinds of quantification:

Something that is F: name of an object: ranges over entities without identity criterion

Some F: name for an object, ranges over entities with a criterion of identity associated with it.

2.3. Dummett

Sortals have the function of 'carving out' objects from reality

Reference is sortal-relative or else it is reference to a 'mere portion of an amorphous reality', by pronouns like *this* and *that*:

(2) a. This is a woman.

- b. This is the same river, but not the same water as that.

Alternative analysis (Moltmann, ms):

as specificational sentences: subject specifies question, postcopula NP answer

this, *that* stand for questions, functions from indicates (and sortal concepts) to objects,

postcopula NP gives answer, i.e. introduces object

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2.4. More widely accepted contemporary view about reference and sortals:

Reference generally held not to require a sortal (at least if not purely by description),

There is also direct reference, reference without the help of a reference-fixing description containing a sortal (Kripke's view of proper names, Kaplan's view of demonstratives)

A sortal is necessary, though, for reference when reference is by description only, in the case of sortal-free definite descriptions (*what you see in front of you, what you were touching, the cause of the accident, the target of his attention*)

3. Sortals and Reference to Abstract and 'Derived' Objects

Claims:

[1] Sortals do play a role for reference, especially for abstract objects, introduced by nonreferential expressions, e.g. *that*-clauses, predicates, verbs, numerals

Terms used non-referentially:

provide potentially presentations of entities, present pluralities of entities

[2] two semantic levels:

1. predicates taking nonreferential expressions as complements:

predicates do not apply to objects, but operate on 'presentations' or pluralities of entities

2. use of sortal: introduces object on the basis of nonreferential expression

Nonreferential occurrence determines, to an extent, the properties the newly introduced object will have.

Predicates apply to objects

[3] Some predicates require sortal-free presentation of what they operate on:

predicates sensitive to the parts of what they operate on:

- predicates selecting only plurals: *compare, enumerate, distinguish*

- predicates selecting only *that*-clauses: *think, shout, write*

4. Sortals and natural language

4.1. Are all count nouns sortals?

Two interesting cases:

[1] the noun *thing*?

the paradigm:

some thing, some nice thing, some object, some entity, some being

(3) How many things are there in the room?

no answer, infinitely many, depends on contextual sense of *thing*, n 'ordinary' objects with sufficient integrity

thing as a pro-sortal or in fact real sortal or some sort

[2] the morpheme *-thing*:

-thing-quantifiers / pronouns

the paradigm:

everything, something, something nice, nothing, several things, many things, what

Sortal-free quantifiers, but still participating in the mass-count distinction:

mass: *something, nothing, what*

plural: *several things, many things*

Lowe:

(4) a. Every thing is a thing. (true)

b. Everything is a thing. (false)

4.2. (Other) contexts where *something* and *some thing* are not interchangeable:

[1] *Something* replaces nonreferential complements

(5) a. John said something nice (namely that S).

b. * John said some nice thing (namely that S).

(6) a. John became something admirable (namely a martyr).

b. * John became some admirable thing (namely a martyr).

(7) a. John is looking for something (namely a German newspaper).

b. * John is looking for some thing (namely a German newspaper).

[2] *Something* ranges over entities that are potential arguments of the predicate, but do not have the status of objects

quantification over pluralities:

- (8) a. John ate the peas.
 b. John ate something.
 c. ?? John drank ate some thing / some entity.

quantification over kinds – pluralities of possible entities

e.g. kind of behaviour (a kind of trope):

- (9) a. John showed humility.
 b. John showed something.
 c. ?? John showed some thing.

identity:

- (10) John showed the same thing as Mary, namely humility.

countability:

- (11) John showed many things, humility, diligence, and intelligence, among them.

4.3. sortals, predication, and proforms

For animate beings:

sortal proforms: *someone, who*

nonsortal proforms: *something, what*

- (12) a. Who is John?
 b. He is a baker (*il est un boulanger*) / an American from Texas / a guy I know from college

answer: sortal or phase sortal

- (13) a. John is nice and intelligent / John is a baker (*il est boulanger*).
 b. What is John?

nonsortal (incl nouns without determiner in French and German)

5. Semantic effects of explicit sortals

... besides that of being essential part of reference-fixing definite description

5.1. Reifying effect of sortals with plurals and bare mass nouns:

- (14) a. John enumerated / distinguished / compared the children.
 b. ?? John enumerated / distinguished / compared the sum / collection of the children.

- (15) a. The children are heavy.
 b. ?? The sum of the children is heavy.

- (16) a. The children are many / numerous.
 b. * The sum of the children is many / numerous.

- (17) a. Generosity is nice.
 b. ?? Some entity / Some property is nice.

Reifying effect is absent with *-thing*-quantifiers:

- (18) a. John compared *something*, namely the things in the different boxes.
 b. There is *something* John cannot distinguish and that is his own children / dark colors.
 c. Generosity is nice.
Something is nice.

Lexical meanings of predicates when plurals and bare mass nouns do not refer to entities (collections, kinds), but present pluralities of entities / possible entities: multigrade predicates, i.e. some 'positions' in the predicate allow for unlimited number of arguments

5.2. That-clauses as non-referential terms

- (19) a. John thinks (whispered / shouted / wrote) that Mary prefers Sue.
 b. * John thinks (whispered / shouted / wrote) the proposition / the possibility that Mary prefers Sue.

- (20) a. John believes that Mary prefers Sue.
 b. John believes the proposition that Mary prefers Sue.

That S does not refer to a proposition.

How to deal with *think* etc:

Russellian multiple-relations analysis:

Think takes unlimited number of arguments, in a certain order, for one of its positions;

Or: specifies n+1-ary relation in context in which it takes *that*-clause with n propositional constituents

That-clause: presents ordered plurality of entities (propositional constituents)

Predicates sensitive to internal structure of proposition will be able to operate only on what is presented by a mere *that*-clause; they are unable to take sortally introduced propositional objects as arguments.

Plural anaphora:

- (21) a. John noticed that S and that S'. Mary noticed ?? them / OK these facts too.
 b. John noticed the fact that S and the fact that S'. Mary noticed them too.
- (22) a. John believes that S and that S'. Mary believes ?? them / OK those propositions too.
 b. That S and that S' are two propositions that John believes. Mary believes them too.
- (23) a. John stumbled and fell. ?? They / OK These events happened this morning.
 b. Two events occurred. They happened this morning. (Geis)

plural anaphora with bare mass nouns:

- (24) a. John shows wisdom and intelligence.
 b. ?? Mary shows them too.
 c. Mary shows it too.
- (25) a. John instantiates the property of being wise and the property of being intelligent.
 b. Mary instantiates them too.

'reification':

Introducing an object on the basis of a nonreferential term:

- (26) a. That S is nice.
 b. The fact S is nice.
- (27) a. That S is not believable.
 b. the proposition that S is not believable.
- (28) a. That is S is an interesting fact.
 b. That S is a proposition I would never believe.
- (29) a. The children are nice.
 b. The group / collection of the children is nice.
 c. These children are a very nice group.

Nouns like fact, proposition, group, collection: have semantic function of applying to the value of nonreferential term or a multitude of entities and mapping it onto an object.

6. Numerals as Non-Referential Terms

6.1. external and internal properties

- (30) a. Four is divisible by two.
 b. The number four is divisible by the number two.
- (31) a. Twelve, which is a number that interests me a lot, is an important number in religious and cultural contexts.
 b. ?? Twelve, which interests me a lot, is an important number in religious and cultural contexts.
 c. Twelve interests me more than eleven.
- (32) a. twelve, which is a number I like to write my dissertation about, ...
 b. ?? twelve, which I like to write my dissertation about, ...
- but:
- (33) a. Twelve, which is divisible by two, is not a prime number.
 b. Twelve, which is smaller than fifteen, is greater than ten.

'external properties': 'interests me', 'write about'

'internal properties': 'divisible by two', 'is greater than' etc

eight, the number eight: share internal properties

the number eight: also external properties

eight, but not *the number eight* selected by the predicate *count*:

- (34) Every day, John has to count the visitors. Today he counted ten, yesterday he counted two, before yesterday he counted zero.
- (35) # John counted the number ten.

Accounting for the difference:

Hofweber's cognitive type shift: Simple numerals retain semantic type of determiners, but obtain syntactic status of singular terms – with predicates expressing internal properties

Numerals with sortal number: semantic type shift, reification of numbers of as objects
Object so introduced will obtain all the properties attributed to the semantic value of the corresponding numeral.

Determiner meaning basic, point of departure for the formation of a singular term referring to numbers as abstract objects (*the number eight*).

The reifying function of sortal predicates:

- (36) a. Twelve is a number I like to write my dissertation about.
b. # I like to write my dissertation about twelve.

sortal-free quantifiers replacing numerals:

- (37) a. John added something to something else, namely he added ten to twenty.
b. John added something to the number of children: he added two.
c. John counted the same thing as Mary when he counted the visitors, namely twentythree.

**6.2. Further evidence for the nonreferential status of numerals (in German):
two kinds of relative pronouns in German**

sortal-independent relative pronouns: *was*

alles, was; nichts, was, vieles, was

'everything that', 'nothing that', 'many things that'

sortal-dependent relative pronouns: *das, der, die, die*

das Ding, das / alle Dinge, die

'the thing that / all things that'

facts / propositions / possibilities:

- (38) a. Dass p, was / * das mir schon seit langem bewusst war, ist allen bekannt.
'That p which I have been aware of for a long time, is known to everyone.'
b. Die Tatsache dass S, die / * was mir schon seit langem bewusst was, ist allen bekannt.
'The fact that p which I have been aware of for a long time, is known to everyone.'

- (39) a. Dass es morgen regnet, was / * das sehr unangenehm ware, ist praktisch ausgeschossen
'That it will rain tomorrow, which would be very unpleasant, is practically excluded.'
b. Die Moeglichkeit, dass es morgen regnet, was / * das sehr unangenehm ware, ist praktisch ausgeschossen.
'The possibility that it will rain tomorrow, which would be very unpleasant, is practically excluded.'

numbers:

- (40) a. zwolf, was / * das / *? die eine Zahl ist, die mich sehr interessiert, ...
'twelve, which is a number that interests me a lot, ...'
b. zwolf, was / * das / * die durch zwei teilbar ist, ...
'twelve, which divisible by two, ...'
c. die Zahl zwolf, die / * was durch zwei teilbar ist, ...
'the number twelve, which divisible by two, ...'

plural anaphora with numbers in German:

- (41) a. Hans addierte zehn und zwanzig.
'John added ten and twenty.'
b. ?? Maria addierte sie auch.
'Mary added them too.'
c. Maria addierte diese Zahlen auch.
Mary added those numbers too.
(42) a. Hans addierte die Zahlen zehn und zwanzig.
'John added the numbers ten and twenty.'
b. Maria addierte sie auch.
'Mary added them too.'
(43) a. Hans notierte zehn und zwanzig.
'John wrote down ten and twenty.'
b. ?? Maria notierte sie auch.
'Mary wrote them down too.'
c. Maria notierte diese Zahlen auch.
'Mary wrote those numbers down too.'
(44) a. Hans notierte die Zahlen zehn und zwanzig.
'John wrote down the numbers ten and twenty.'

b. Maria notierte sie auch.

'Mary wrote them down too.'

- (45) a. Three and five are both prime numbers. They are not divisible by two.
b. Three and five are not divisible by two. ? They are both prime numbers.

6.3. accounting for the nonreferential status of numerals semantically

If numerals are nonreferential, how should number predicates be understood?

The **adjectival strategy** in the philosophy of mathematics (for example H. Hodes 1984 'The ontological commitment of arithmetics', *Journal of Philosophy* 81, 123-49):

- (46) a. Two plus two is four.
b. If there two things and two other things, then there would be four things.
c. $(\exists \geq 2 x Fx \ \& \ \exists \geq 2 x Gx \ \& \ \neg \exists x (Fx \ \& \ Gx)) \rightarrow \exists \geq 4 x (Gx \vee Fx)$

adjectival strategy applies to predicates expressing internal properties, but not to predicates expressing external properties

7. Further data

7.1. quotations

- (47) a. Bill wrote down 'Mary' and 'Sue'.
b. ?? John wrote them down too.
(48) a. Bill wrote down the names 'Mary' and 'Sue'.
b. John wrote them down too.
(49) a. John gave his child the name 'Mary'.
b. # John gave his child 'Mary'.
(50) a. Susanne call's herself 'Sue'.
b. # Susanne calls herself the name 'Sue'.
(51) a. 'Maria', was / ? # der der Name dieser Frau ist...
'Mary', which is the name of this woman....

b. der Name 'Maria', der der Name dieser Frau ist....

7.2. names for places and times

caution: somewhat fluctuating intuitions

places

- (52) We visited John and Bill. Did you visit them too?
(53) a. We visited Munich and Salzburg.
b. ?? Did you visit them too?
c. Did you visit those two cities too?
(54) a. We visited the cities Munich and Salzburg.
b. Did you visit them too?
(55) a. Hans, den / * was ich gut kenne, kommt auch.
'John whom I know well, will come too.'
b. Tuebingen, was / * das ich gut kenne, besuchen wir auch.
'Tuebingen, which / which (neut) I know well, we will visit too.'
c. Die Stadt Tuebingen, die / * was ich gut kenne, besuchen wir auch.
'The town Tuebingen, which / which I know well, we will visit too.'

times:

- (56) a. Mary is looking forward to 2008 and 2009.
b. ?? Bill is looking forward to them too.
(57) a. Mary is looking forward to the year 2008 and the year 2009.
b. Bill is looking forward to them too.
(58) a. das Jahr 2001, als / ?? in dem Maria geboren wurde....
'the year 2001, when / in which Mary was borne....'
b. 2001, als / ?? in dem Maria geboren wurde....