Plural Reference: New Applications and Challenges

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1. Plural reference

(1) The children gathered.
- predicate takes plural term as argument --

*The children gathered* is true iff *gather* is true of the x such that *child* is true of x.

Multigrade predicates:

n-place predicate has n-places where the m-th place has an indeterminate number of positions

(n-place is of variable adicity)

one argument for plural reference:

Predicates / readings of predicates only selecting plurals:

(2) a. * John enumerated / counted / compared / distinguished the collection / the sum / that entity .

   b. The children are heavy. (distributive reading available)

   c. The sum / collection / entity is heavy. (only collective reading)

Distributivity

(3) *The N P* is true iff for any x < [the N] P is true of x.

Higher-order plurality:

(4) a. John distinguished / compared / evaluated the red balls and the green balls.

   b. John counted / enumerated the red balls and the green balls.
(5) a. John distinguished / compared / evaluated the things here and there.
   b. John counted / enumerated the things here and there.

2. Distributivity

established generalizations:

[1] distributivity takes into account contextual divisions of plurality into subcollections / individuals (Moltmann, Schwarzschild, Gillon)

(6) a. The people gathered.
   b. John has evaluated the students.

Systematic polysemy of any expression with respect to any argument position allowing for either individuals or pluralities:

(7) a. John did not evaluate the students.
   b. Can John lift the boxes? presupposes: either together or individually
   c. John has lifted the boxes individually or together.

selectional restriction on application of distributivity:

(8) a. The things are heavy.
   b. The collection of things is heavy.
(9) a. John has evaluated the students.
   b. John has evaluated the class.
(10) a. The paintings are expensive.
    b. The collection of paintings is expensive.
(11) a. The team members lifted the piano.
    b. The team lifted the piano.

formulating the restriction:
possibility 1: singular vs plural? NO:
[1] the effect of whole:
(12) a. The whole collection is expensive.
b. John has evaluated the whole class.

[2] the special quantifiers / pronouns: *something, what:*

   b. Even John has evaluated something; namely the paintings.
   c. John has evaluated several things, the paintings, the statues and the coins.

*something*: singular, but not necessarily mass: *several things*

distributivity also with mass NPs:

(14) a. John has evaluated the material.
   b. The stuff was given away.

possibility 2: integrity expressed by count noun / sortal:

*Whole*: as an integrity dissolver

(15) a. John has evaluated the whole class.
   b. The whole treasure was given away.

problem (later): not generalizable to two kinds of kind-referring terms

*Something vs some thing:*

(16) a. Something John has not yet evaluated is this material.
   b. ?? Some thing that John has not yet evaluated is this material.

(17) a. There is something John cannot distinguish and that is the leaves.
   b. ?? There is some thing that John cannot distinguish and that is the leaves.

Same condition on lexical meaning

Selectional restriction and sensitivity to contextual partition not limited to distributivity

obtains for any predicate making reference to the parts, but not the whole of an argument

(18) a. John compared the students.
   b. # John compared the class.

(19) a. The students like each other.
b. # The class likes each other.
(20) a. John cannot distinguish the students.
b. # John cannot distinguish the class.
(21) a. The students are similar.
b. # The class is similar.
(22) a. John counted the students.
b. John counted the group of students. (means: he counted one)
(23) a. The students are numerous.
b. # The class is numerous.

Exempt from the condition: predicates also making reference to the whole:
organize, rank, dissolve, re-arrange

(24) John organized / rearranged the collection of things on his desk.

the effect of whole on the application of lexical meaning:

(25) a. The whole collection is indistinguishable.
   . John has counted the whole class.

Several things still quantifies over things that are ‘accessible’:

(26) There are several things John cannot distinguish, the leaves, the letters of the alphabet, and his marbles.

(27) The Accessibility Requirement

A predicate or semantic operation making reference to the parts, but not the whole of an argument can apply to an object d in a situation s only if
- d is not an integrated whole in s.
- d is not a referent of a count NP / a sortal in s

General observation about Accessibility: no coercion possible:

(28) a. The collection is expensive. (no distributive reading possible, under any effort)
b. The class is similar. (impossible to make predicate acceptable on an internal reading)
This is unlike any other semantic selectional requirements!

(29) The book has ended. → coercion possible (the even of reading the book has ended) suggests: ontological account of accessibility requirement implausible: accessibility does not require arguments to be of a certain type, but …. requires plural terms: the predicates involve argument place specifically for plurals

_ the whole collection:_ plural term: referring to the various individual paintings…

4. Further application of plural reference 1: _That_-clauses: the multiple relations theory of attitudes

**The Substitution Problem:**

(30) a. John thought that Sue likes Mary.
    b. * John thought the proposition that Sue likes Mary.
    c. * John thought that entity …..

(31) a. John believes that S.
    b. John believes the proposition that S.

**The Objectivization Effect:**

(32) a. John imagined that S.
    b. John imagines the proposition that S.

(33) a. John fears that S.
    b. John fears the proposition that S.

_fear 1:_ fear(a, d): two place-relation

_fear 2:_ fear that S: complex predicate expresses property
accounting for the Substitutivity Problem and the Objectivization Effect:

The multiple relations view of attitudes (Russell, Moltmann 2003):

(34) a. think(John, LIKE, Sue, Mary)
    b. think as syncategorematic (‘incomplete symbol’): in a given syntactic context, with a
that-clause specifying n propositional constituents: think expresses an (n+1)-place relation
think as multigrade: think: (a; R, C1, C2, ….) (too simple…)

that-clauses involve plural reference to propositional constituents, in a certain order (and
further structure?),

unlike singular count NPs such as the proposition that S, the entity that…

think, fear2 etc take complement expressing plural reference with ordered pluralities:

German Worte vs Woerter ‘words:

    ‘Hans said these words.’
    b. * Hans sagte diese Woerter.

    ‘John has used these words. Mary has used them too.’

(37) a. Dass alles verziehen sei, waren seine letzten Worte.
    ‘That everything was forgiven were his last words.’
    b. * Dass alles verziehen sei waren seine letzten Woerter.
    c. Seine letzen Worte / * Woerter waren, dass alles verziehen sei.

Propositional quantifiers as plural quantifiers:

(38) a. John thought that S.
    John thought something.
    b. John said those words.
John said something.

c. John and Mary thought that S.

John and Mary thought the same thing.

d. John said that S1, that S2, and that S3.

John said several things.

Common semantic selectional requirement:
Verbs taking only *that*-clauses (and quantifiers like *something*), but not the *proposition that* S etc:

*think, write, shout, whisper*

By contrast: *believe, assert, is true*

common feature:

*think* – can describe occurrent thought (not possible with *believe*)

*Think, write, shout, whisper*: describe manner of occurrent mental act whose structure is reflected (to an extent) in the structure of the *that*-clause.

Verbs care about internal structure of semantic value of *that*-clause

*count, enumerate, compare, distinguish* taking only plural arguments, not singular count NPs:

Predicates caring in a particular way about the individual elements of the semantic value of their complement (but not the value as a whole) can take only plural arguments, not singular count arguments.

⇒ Accessibility Requirement

**problem:**

(39) John said that Mary kicked Sue.

Bill said that Sue kicked Mary.

There is something both John and Bill said.
Alternatives:
- *Something* as a nominalizing quantifier: ranges over things of the sort John’s claim that S, John’s thought that S, the claim that S, the thought that S. (Moltmann 2003)
- plural reference with ordered ‘pluralities’

possibilities:
- plural reference to individuals in a situation specifying configuration
- plural reference to a sequence …

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4. Kind-referring terms

Carlson’s kind reference

Bare plurals and mass nouns refer to kinds.

Different instance-related readings with different predicates due to lexical meaning.

The type ‘kind’ triggers particular instance-related readings of the predicate.

stage-level predicates: existential quantification over instances

(40) a. John found gold.
    b. John bought apples.

individual-level predicates: generic / universal / … quantification over instances

(41) a. Gold is shiny.
    b. Apples are healthy.

(42) a. \([P]^w,t(d, k) = 1 \iff \text{Gn } d' \ [d' I_{w,t} k] \ [P]^w,t(d, d') = 1\) if P is a transitive individual-level predicate.
    b. \([P]^w,t(d, k) = 1 \iff \exists d' (d' I_{w,t} k \& [P]^w,t(d, d') = 1)\) if P is a transitive stage-level predicate.

intensional verbs: existential quantification over instances in possible satisfaction situations
(43) a. John needs gold.
   b. John needs apples.
(44) a. Yellow roses exists.
   b. Three-legged dogs exist.

‘instance-distribution’ predicates: take all instances into account
(45) a. Dinosaurs are extinct.
   b. Pink diamonds are rare.
   c. Pigeons are widespread in Europe.

Convincing arguments for kind reference:
[1] Same readings with ‘explicit’ kind-referring terms (Carlson):
(46) a. John found this kind of fruit.
   b. This kind of animal is striped.
   c. John needs this kind of metal.
   d. This kind of animal exists.

[2] copredication of predicates from different classes:
(47) Diamonds are very expensive and hard to find.

[3] Special quantifiers ranging over kinds:
(48) John found something that is rare, not often needed, and very expensive, namely diamonds.

[4] Definite kind-referring NPs:
(49) a. John never encountered the belief that the devil exists.
   b. The belief that the devil exists is unfounded.
   c. John lacks the belief that the devil exists.
   d. The belief that devil exists is widespread.
(50) a. John never developed the desire to become rich.
   b. The desire to become rich is not inborn.
   c. John lacks the desire to become rich.
   d. The desire to become rich is widespread.
terms referring to ‘kind objects’:

appositive kind terms:

(51) a. John found the kind gold.
    b. The kind gold is shiny.
    c. John needs the kind gold.
    d. The kind gold is rare.

(52) a. John encountered something unpleasant, namely hostility.
    b. John encountered some unpleasant thing.

Plural quantifiers with kind reference:

c. John encountered several unpleasant things, hostility, rejection, and ignorance.

definite kind terms:

(53) a. ?? John found the lion.
    b. ?? John is looking for the lion.

(54) The lion has a mane.

(55) a. ?? The lion breathes regularly.
    b. ?? The lion is male or female.

(56) a. Lions are numerous.
    b. ?? The lion is numerous.

Conclusion:

Kind reference (not reference to kind objects) is impossible with ordinary referential terms.
But this is independent of mass-count distinction:

this kind of thing allows for kind reference

these kinds of things, several things allow for kind reference

the Accessibility Requirement:
Instance-related readings of predicates with ‘kind-referring’ terms as manifestations of the Accessibility Requirement

What blocks accessibility is not the count status of ordinary referential NPs:
Kind reference also possible with singular count / plural expressions

(several things, several kinds of things)

Moltmann (2003): distinction between objects and ‘non-objects’;
Kinds, pluralities, quantities: nonobjects
Referents of singular count NPs, including the kind N: objects
Something etc can quantify over non-objects as well as objects
Distibutivity, instance-related readings of predicates can apply only to non-objects
Accessibility means: non-object status of argument

Implausible view:
Why can’t we refer to ‘non-objects’ as ‘non-objects’, that is in another way than by using plurals, bare mass nouns or bare plurals?

A different approach: make use of plural reference:
kinds as modalized pluralities

kind reference then means:
plural reference to all the instances in different possible worlds, at different times

Kind reference as plural reference:
All the predicates possible with kind-referring terms can be understood as predicates taking modalized plural terms:

Derived predicate meanings:
Gold is shiny is true iff for all ‘normal’ x, x < [gold] shiny is true of x

John found gold is true iff for some x < [gold], John found holds of x.

Compare:

(56) The glasses are dirty is true iff for some x, x < [the glasses], dirty is true of x.

Derived meaning of dirty, in relation to some more fundamental meaning

Another example:

Roses are rare true iff for few locations l, few situations s, for some x: x < [roses] and x at l in s.