

## Plural Reference: Linguistic Motivations and Challenges

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### 1. Plural reference and reference to pluralities

Reference to pluralities:

Definite plurals refer to single entities that are ‘pluralities’.

Formal conceptions of pluralities as ‘one’: sums, sets, classes

(1) a. [*the children*]<sup>s</sup> = sum([*children*]<sup>s</sup>)

Plural reference:

Definite plural NPs refer to several individuals at once.

*The children* refers to each child in the situation at once.

Plural logic:

logic containing plural variables, plural terms, plural predicates

### **The mereological account of reference to a plurality (Simons, Link, ..)**

- Part relation is transitive and closed under sum formation

- Definite plurals stand for sums

- Needs to make use of a count-noun-specific part relation:

Definite plurals stand for sums of atoms wrt. part relation among entities in the denotation of plurals

Basic facts about plurals

[1] Collective vs distributive interpretations

Predicates displaying only a collective interpretation:

(1) b. The children gathered.

Predicates displaying only a distributive interpretation:

(1) c. The children slept.

Predicates displaying both a collective and a distributive interpretation:

(1) d. The boxes are heavy.

Standard account of (1d):

Lexically conditioned inference:

(2) a. If P is true of the collection x, it is true of each member of the collection of the children

b. If P is true of each x among the children at once, then P is true of each x.

Two account of the distributive interpretation of predicates allowing both:

1. Distributive operator (the most common view)

Argument in favor: speaker must have either distributive or collective reading in mind

2. Disjunctive lexical meaning (Moltmann 1997):

Argument in favor: the possibility of disjunction of collective and distributive modifiers:

*together and alone*

[2] Higher-level plurality:

(3) a. John compared the men and the women.

b. John compared the students (in the different classes)

Fairly straightforward account within reference to plurality approach

E.g. higher-level pluralities involve mapping sums to 'atoms' (though atoms wrt part relation among entities in the denotation of plural nouns) (Link)

Alternative to the extensional mereological account of reference to a plurality:

**The 'information-based account' (Moltmann 1997, 2005):**

The approach:

- Part-whole relations are driven to an extent by conditions on integrity, integrity conditions to an extent provided by situation of reference

- Single part relation for individuals and pluralities

Conditions on the part relation:

- Restriction on sum formation: sum of individuals exists only if it would be an 'integrated whole'.
- Restriction on transitivity: integrated whole blocks transitivity of part relation

Kinds of integrity for pluralities:

- being a maximal entity whose (immediate) parts are related by some relation R
- being a maximal entity whose (immediate) parts are all P, for some property P.

Example:

the children: maximal entity whose members are children.

Distinction between essential and accidental integrated wholes:

Essential integrated wholes:

wholes for which relation R or property P connecting or characterizing its parts is constitutive (essential)

Accidental integrated wholes:

wholes for which relation R or property P characterizing its parts is constitutive (essential)

Two kinds of accidental wholes:

- integrity based on accidental property or relation

*the two neighbors, the students that were nervous*

- integrity based on limited information / choices in the context:

example:

the children: maximality based on limited number of students chosen in context

Context (situation of reference):

carries (generally) at least the information given by descriptive content of NPs (nouns, adjectives, relative clauses)

*the red and blue things*: whole composed of two accidental wholes

*the red things and the blue things*: whole composed of the same two accidental wholes

## **2. Problems for the mereological approach**

### **2.1. The linguistic basis for reference to a plurality**

Connection to the singular-count distinction is not strict:

[1] The effect of *whole*:

- (4) a. The whole collection is expensive.  
 b. John has evaluated the whole class.

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

- (5) a. What did John evaluate? – the paintings.  
 b. Even John has evaluated something; namely the paintings.  
 c. John has evaluated several things, the paintings, the sculptures, and the drawings.

*something*: singular, but not necessarily mass

*several things*: plural

Problem for count-noun-specific part relation !

## 2.2. Collective predicates

Referents of definite plurals:

Always accidental wholes (or information-driven wholes) (except for: *the Beatles* etc. ?)

‘Parts’ of pluralities:

individual members: generally essential wholes

sub-pluralities that count as relevant parts: generally accidental wholes (or information-driven wholes)

Distributivity relative to contextual division:

- (6) a. The people gathered. (partition)  
 b. The stones are heavy. (partition)  
 c. A, B, and C wrote musicals. (wholes?) (cover)

Part-structure-sensitive collective predicates: *compare, distinguish, similar*, etc.

- (7) a. John compared the students.  
 b. John cannot distinguish the students.  
 c. The students are similar.

Predicates that can take into account only individuals as part of pluralities:

*count*, number predicates, number-related predicates:

- (8) a. John counted the people.

- b. The stones are numerous.
  - c. The students are twenty.
- (9) a. John enumerated the students.
- b. John named the students.

### 2.3. Advantage of the information-based account

Attributive readings of plural descriptions:

(10) John needs to compare the students (in the various classes, whoever they may be)

Sentence may involve the same way of partitioning in a world in which there are other students than there actually are.

Serious problem for approaches using covers of actual pluralities (Schwarzschild, Gillon) !

Information-based account (can be developed in such a way that):

interpretation of *the students* relativized to a situation type containing just ‘information’, not entities, e.g. property of being maximal plurality of students, property of being maximal plurality of individuals standing in the relation of ‘being in the same class’

When evaluating sentence in an actual situation:

information is applied to actual individuals and (accidental) wholes are formed.

## 3. Problems for reference to a plurality

### 3.1. Collective predicates and distributive interpretation

(Apparent) selectional restriction on application of distributivity:

- (12) a. The things are heavy.
- b. The collection of things is heavy.
- (13) a. John has evaluated the students.
- b. John has evaluated the class.
- (14) a. The paintings are expensive.

- b. The collection of paintings is expensive.
- (15) a. The team members lifted the piano.  
b. The team lifted the piano.

Same selectional restriction for any predicate making reference to the parts, but not the whole of an argument:

- (16) a. John compared the students.  
b. # John compared the class.
- (17) a. The students like each other.  
b. # The class likes each other.
- (18) a. John cannot distinguish the students.  
b. # John cannot distinguish the class.
- (19) a. The students are similar.  
b. # The class is similar.
- (20) a. John counted the students.  
b. John counted the group of students. (means: he counted 'one')
- (21) 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*

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

The effect of *whole* on the application of lexical meaning:

- (23) a. The whole collection is indistinguishable.  
b. John has counted the whole class.

*Several things* still quantifies over things qualifying as pluralities:

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

Reference-to-a-plurality approach:

The restriction will be viewed as a sortal restriction of particular predicates (predicate argument positions) to certain types of entities / to certain entities with particular properties in situations.

(25) The Accessibility Requirement (Moltmann 1997):

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  $s$ .

alternative: ‘... only if  $d$  is not an atom.’

### **General observation about Accessibility**

[1] No coercion possible:

(26) a. The collection is expensive. (no collective reading)

b. The class is similar. (no collective reading)

standard cases of coercion:

(27) a. John started reading the book.

b. John started the book.

(28) a. John proposed a movie.

b. John proposed watching a movie.

Makes status as selectional restriction implausible!

[2] Further arguments against ontological account:

- part-structure-related *as*-phrases: *as a whole, as a collection*

(29) a. John evaluated the students as a whole.

b. The students as a whole are similar.

- accidental wholes:

(30) ? John compared the (loose) collection of things on his desk.

Reformulating the constraint in terms of plural reference:

(31) A predicate or semantic operation making reference to the parts, but not the whole of an argument in a particular argument position is a plural predicate in that argument position.

Contextual divisions into sub-pluralities:

Reformulating the information-based account using plural logic:

(32) a. John compared the students.

S: are in the same class

b.  $\forall xx (xx < [the\ students] \ \& \ Sxx \rightarrow \text{John compared } xx)$  (distributive interpretation)

c.  $\forall xx \ yy (xx < [the\ students] \ \& \ Sxx \ \& \ yy < [the\ students] \ \& \ Syy \ \& \ \neg \ xx < yy \rightarrow \text{John compared } xx \text{ to } yy)$  (collective interpretation)

### **3.2. Division of pluralities is more construction-driven than predicted by the ontological or information-based account**

(33) a. John compared the men and women.

b. John compared the men and the women.

(34) a. The fathers, sons, mothers and daughters resemble each other.

b. The fathers and the sons and the mothers and the daughters resemble each other.

Nicolas/Linnebo (2008):

(35) a. The things that are square, blue, or wooden overlap.

b. The square things, the blue things, and the wooden things overlap.

When is contextual division possible otherwise?

predicate inducing a division by involving reference to other objects:

(36) a. The people wrote musicals.

b. The people gathered.

c. John compared the students.

## **4. Reconsidering collective predication**

Collective predication more restricted than generally thought.

Predicates with no collective reading (Moltmann 2004):

Gestalt-related, extension-related predicates: *big, long, round, extended*



- (37) a. The children are big.  
 b. The pearls are long.  
 c. The grains are round.  
 d. The fields are extended.

Suggests that predicates that can apply only to pluralities are derived from singular predicates (in certain ways, on the basis of singular relational predicates for example)

Pure plural predicates are derived, in one way or another.

Kinds of collective predicates:

- Relational predicates

*neighbors, similar, equal*

- Event-related predicates

*gather, lift the piano*

reduced relative clauses:

*the people gathering in the garden*

- Measure-related predicates

*heavy, numerals?*

*heavy*: collective reading in predicate position not as (restrictive) noun modifier:

- (38) a. The stones are heavy.

b. the heavy stones

- (39) a. The students are four.

b. the four students (only non-restrictive reading)

Distinction between plural predicate and multigrade predicate:

Plural predicate (place):

applies to several at once (in order to give truth)

Multigrade predicate (place):

takes an (unlimited) number of arguments, possibly in a certain order,

arguments can be repeated

Examples: (second place of) *add, multiply*

Each position in a multigrade place can itself be plural or multigrade.

Hypotheses about the origin of collective predicates and predicates applying to higher-level pluralities:

1. Predicates that have relational alternates are multigrade:

*compare (with), similar (to), overlap (with), add (to), multiply (with)*

multigrade variant: treats all positions the same (slight difference in meaning)

2. Eventive predicates

plural predicates on the basis of relation of participation of individuals in collective event

3. Measure predicate

Are plural predicates on the basis of relation of (individual) contributing to collective measurement

## **5. Reification of pluralities**

(40) a. John has tasted two things, the peas and the beans.

b. John dislikes several things, his paintings, his drawings, and his sculptures.

## **6. Potential problems for the plural-reference approach**

Semantic parallels between singular count and plural NPs (and mass NPs):

Partitive construction:

(41) a. all of the house

b. all of the children

c. all of the wood

*whole* in some languages

(42) a. das ganze Haus ‘the whole house’

b. die ganzen Leute ‘the whole people’

c. das ganze Holz ‘the whole wood’

*partly:*

(43) a. The house is partly white.

- b. The people are partly French.
- c. The wood is partly dry.

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**Just some references**

- Linnebo, O. / D. Nicolas (2008): 'Superplurals in English'. *Analysis* 68.
- Moltmann, F. (1997): *Parts and Wholes in Semantics*. Oxford: Oxford UP.
- (2004): 'Two Kinds of Universals and Two Kinds of Collections'. *Linguistics and Philosophy* 27.6., 739-776.
- (2005): 'Part Structures in Situations: The Semantics of *Individual* and *Whole*'. *Linguistics and Philosophy* 28, 599-641.
- (2012): *Abstract Objects and the Semantics of Natural Language*. Oxford UP, Chapter 1.