*The Ontology and Semantics of Parts and Wholes*

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Handout 6

**Limits of the Semantics of Part-Whole Structure:**

**Motivations for Plural Reference**

**1. Plural reference so far – on a mereological approach**

**1.1. Extensional mereology and mereology**

Extensional mereology

Part-whole structure consists in a domain of entities being ordered by a part-of relation (partial order), with unique sums.

Mereology: the general theory of part-whole structure

Part-whole structure consists in domain of entities being ordered by a part-of relation, possibly involving conditions of integrity.

**1.2. The mereological approach to plurals**

Recall

Parallelism among the semantics of singular count, plural, and mass NPs

Part-whole related expressions applicable to the (apparent) part-whole relation of individuals, pluralities, quantities

1. Partitive construction: *part of / some of / most of / all of*

(1) a. part of / some of / most of / all of the house

 b. part of / some of / most of / all of the students

 c. part of / some of / most of / all of the wood

2. *and* as non-Boolean conjunction

(2) a. The men and the women met.

 b. The men and women met.

 c. The oil and vinegar were mixed.

 d. The flag is white, red, and green.

 e. The sandwich / ??? The bread, butter and ham was one of the items on the menu.

3. Relation to Davidsonian events: part structure inheritance

(3) a. John ate the apple in an hour.

 b. John ate the apples in an hour.

 c. John drank the wine in an hour.

Incremental theme:

For a verb V, an event e, and an object o, Incr-theme(e, o) iff for any two parts o1 and o2 of o, there are parts e1 and e2, (theme(e1, o1) and theme(e2, o2) and V(e1), V(e2), and V(e1 ⊗ e2).

4. Other semantic parallelisms

Singular count, plural, and mass NPs to an extent select the same determiners: *the, some, no*

Singular count, plural, and mass NPs can to an extent be arguments of the same predicates:

(4) a. I saw John and Mary / the children / the cattle.

 b. the heavy stone / stones / material

**1. 3. The assumption of the mereological account**

Definite plural NPs stand for sums of individuals

Conjunctions of singular or plural NPs stand for sums of individuals

(5) a. [*the students*] = ⊗([*student*])

 b. [*John and Mary*] = John ⊗ Mary

 c. [*the students and the children*] = (⊗([*student*])) ⊗ (⊗([*children*]))

 d. [*the students and the children*] = ⊗([*students*] ∪ [*children*])

The extensional mereological account

Every set of individuals has a sum.

Mereological account with integrity conditions

Making use of the notion of an R-integrated whole:

Only sets of individuals that are maximally R-connected have a sum, for a suitable relation R.

(6) For a non-empty set X and a non-logical relation R, if for all x, y, x ∈X, y ∈ X, x Rtrans y

 and for no z, z ∉ X, x Rtrans z, then ⊗(X) exists.

No uniqueness of sums for a set of individuals: structured sums:

Distinguish (⊗([student])) ⊗ (⊗([children])) and ⊗([*students*] ∪ [*children*])

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**2. Higher-level plurality**

**2.1. Second-level plurality (‘superplurals’)**

Phenomena: Distributivity and part-related predicates

(7) a. The students were evaluated.

 b. John compared the students.

Second-level plurality readings facilitated by description

Conjunctions:

(8) a. John compared the male students and the female students
 b. John compared Joe and Bill and Mary and Sue

Relational nouns:

(9) a. John the compared the twins in this school.

 b John counted the couples in the crowd.

Collective relative clauses:

(10) The students that share a room will get the same assignment.

Is second-level plurality restricted to relational predicates (*compare – compare with, share – share with* etc.)? Answer: no

(11) a. The three squares overlap.

 b. Square 1 overlaps with square 2, square 2 overlaps with square 3, square 3 overlaps

 with square 1.

(11b) fails to represent one of the readings of (11a).

**2.2. Third-level plurality**

(12) a. The mothers and the daughters and the fathers and the sons have similar problems

 with each other.

 b. The relatives that do not get along show similar behavior.

What makes higher-level plurality possible?

Application of a plural predicate

**2.3. Semantic approaches to higher-level plurality within mereology**

1. Link:

Map subpluralities onto atoms (with respect to the plural-specific part relation)

2. Moltmann 1997

Structured sums (in a situation)

Only integrated subpluralities to form sums

(13) John compared the men and the women

‘The men’ as an atom

‘The men’ as an FF-integrated whole

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**3. Problems for mereological approaches to plurals and higher-level plurality**

The distinction between one and many

Part-related predicates

(14) a. John compared the students

 b. John compared the male and female students.

 c. John compared the male students and the female students

 d. John compared the students that share a room.

 e. John compared the twins in the school

 f. John compared the relatives that do not go along with each other.

Number-related predicates:

No subgroup reading available

(15) a. The students are three in number.

 b. John counted / listed / ranked the students.

(16) a. ? John and Mary are two.

 b. ??? The male and the female students are two.

(17) a. ??? John and Mary are one of the students I invited.

 b. ??? I invited one of the students, John and Mary.

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**4. An alternative to the mereological approach to plurals: plural reference**

Proponents of plural reference: McKay, Yi, Oliver/Smiley, Moltmann (2016)

The idea

Definite plural NPs refer to several individuals at once.

Sum individuals are not needed for the semantics of plurals. The semantics of plurals is a matter of reference, not ontology.

(18) a. *The students* refers to each individual student at once.

 b*. John and Mary* refers to John and Mary at once.

Distributive and collective predication

(19) a. *The students left* is true iff *left* holds of every individual *the students* refers to.

 b. *The students gathered* is true iff *gathered* holds at once of every individual *the*

 *students* refers.

Plural variables

First-level plural variables:

‘xx’: stand for several things at once

Second-level plural variables:

‘xxx’: stand for several pluralities-as-many at once.

Plural descriptions

First-level plurality:

(20) The students: ιxx: student(x)

Second-level plurality:

(21) The students that share a room: ιxxx: student share a room(xx)

Metaphysics with plural reference:

Reality needs to be enriched with plural properties, but not with sums representing individuals.

Challenges for the plural reference approach:

1. How can it account for all the semantic parallelisms between singular count and plural NPs

2. Can there be an analogue of plural reference for mass NPs, which likewise fail to stand for single things?

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