

Summary Examples

Research Methods in Linguistics

Summary Components and Parameters

1. Order of Components

2. Level of Abstraction

(a) Data Generalizations

- Include description of data generalization? Y/N
- Include table/diagram representing generalizations? Y/N
- Include actual data examples? Y/N

(b) Main Claim

- Include description of proposal's sub-components? Y/N
- Include table/diagram representing proposal? Y/N
- Include formalization (eg., tree, rule, formula)? Y/N

(c) (Premises/Reasoning)

- Include description of premises? Y/N
- Include description of theoretical framework? Y/N
- Include definitions of terms? Y/N
- Include table/diagrams representing assumptions? Y/N

(d) (Comparison to H')

- Include description of H'? Y/N
- Include explanation of H' deficiencies? Y/N
- Include table/diagrams representing H' assumptions? Y/N

1 Order of Components

- **Data-Oriented**

(i) Data < Premises/Reasoning < Main Claim < H'

- **Theory-Oriented**

(ii) Main claim < Premises/Reasoning < H' < Data

- **Intermediate Approaches**

(iii) Main claim (H') < Data < Premises/Reasoning (< H')

(iv) Data (< H') < Main claim < Premises/Reasoning (< H')

2 Short Summaries

- **Link 1983: The Logical Analysis of Plurals and Mass Terms**

Link 1983 aims to account for the semantics of plural nouns. He proposes that plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation.

- This is a very short summary that abstracts over the actual data phenomenon (and hence the premises/reasoning). It also leaves out discussion of H' (i.e., the sets theory of plurals).
- This is a summary you might produce for an annotated bibliography, when you've only skimmed the paper.

Link 1983 aims to account for empirical similarities between bare plurals and mass nouns. He proposes that (i) plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation and (ii) mass nouns refer to material, which is related to the domain of atomic individuals by the **MATERIAL-PART-OF** relation. These **PART-OF** relations result in structural similarities between denotation of mass nouns and plurals.

- This summary also abstracts away from the data generalization, but provides more details than the former summary, since it indicates that the

Week 5b: Summary Examples

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Link 1983 aims to account for empirical similarities between bare plurals and mass nouns. He proposes that (i) plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation and (ii) mass nouns refer to material, which is related to the domain of atomic individuals by the **MATERIAL-PART-OF** relation. These **PART-OF** relations result in structural similarities between denotation of mass nouns and plurals.

- This summary also abstracts away from the data generalization, but provides more details than the former summary, since it indicates that the

generalization involves a parallel between mass nouns and plurals.

- The description of the main claim is correspondingly more detailed, involving a component for both plurals and mass nouns.
- This summary provides a vague description of the reasoning between the data generalizations and main claim (i.e., structural similarities).
- This is a summary you might produce for an annotated bibliography, after you've read the article.

Link 1983 aims to account for the observation that plural nouns, like mass nouns, have cumulativity entailments. He proposes that (i) plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation and (ii) mass nouns refer to material, which is related to the domain of atomic individuals by the **MATERIAL-PART-OF** relation. These **PART-OF** relations result in structural domains that satisfy closure and uniqueness, deriving cumulativity entailments in both domains.

- This summary describes the data generalization in more detail, talking about cumulativity entailments
- The reasoning provided in this summary is less vague, providing more of a connection between the data generalization and main claim (although it doesn't provide step-by-step reasoning)
- This summary, however, introduces many technical terms (cumulativity, closure, uniqueness)
- If your audience is not formal semanticists, the increased detail/explanation may just confuse them

Link 1983 aims to account for the observation that plural nouns, like mass nouns, have cumulativity entailments. He points out that an approach treating plural individuals as **SETS** fails to account for the parallel to mass nouns, as mass nouns, lacking atomic parts, cannot similarly be treated as sets. Link proposes that (i) plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation and (ii) mass nouns refer to material, which is related to the domain of atomic individuals by the **MATERIAL-PART-OF** relation. These **PART-OF** relations result in structural domains that satisfy closure and uniqueness, deriving cumulativity entailments in both domains.

- This summary also includes a description of the comparison to H'

Link 1983 aims to account for the observation that plural nouns, like mass nouns, have cumulativity entailments. He also aims to account for the intuition that an object like "my ring," and the gold that makes up the ring, are distinct and may have distinct properties (i.e., "My ring is new, but the gold making up the ring is old.") Link proposes that (i) plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation and (ii) mass nouns refer to material, which is related to the domain of atomic individuals by the **MATERIAL-PART-OF** relation. These **PART-OF** relations result in structural domains that satisfy closure and uniqueness, deriving cumulativity entailments in both domains. The introduction of the **MATERIAL-PART-OF** relation additionally formalizes the distinction between objects and the material that composes them.

- This summary has more details re: the data that the author accounts for.

3 Intermediate-Length Summaries

- **2-pg abstract form**
 - use subsections to identify (sub)components
 - include details of theoretical framework (inline citation of references)
 - include actual data examples (optional)
- **handout (subsection) form** (e.g., for presentation, future reference)
 - use bullets and indentations to identify (sub)components
 - use tables/graphical representations instead of prose
 - include actual data examples
 - include definition of terms
- **prose form (multiple paragraphs)** (eg., for a literature review)
- **Q:** When do you include details about the sub-components of (i) the main claim/proposal, (ii) the reasoning/premises, (iii) H'?
- **A:** Depends on the purpose/audience of the summary!
 - Might you use the formalizations in your own analysis?
Are you trying to teach the formalizations?
If so, include the details of the formalizations!
 - Are you going to argue against the main claim?
If so, include details of the main claim and reasoning!
 - Are you trying to convince an audience of the main claim?
If so, include details of H', and why it is inferior!

4 Example Handout (Sub)Section Summary

Note 1: I like to provide a paragraph summary at the beginning of my handout summaries

Note 2: Since I know I will describe the empirical and theoretical generalization in more detail later in the handout, this paragraph can abstract over those details

Link 1983: The Logical Analysis of Plurals and Mass terms

Link 1983 aims to account for empirical similarities between bare plurals and mass nouns. He proposes that (i) plural individuals refer to a **SUM**, a type of individual related to atomic individuals via the **INDIVIDUAL-PART-OF** relation and (ii) mass nouns refer to material, which is related to the domain of atomic individuals by the **MATERIAL-PART-OF** relation. These **PART-OF** relations result in structural similarities between denotation of mass nouns and plurals.

4.1 Link 1983's Empirical Generalizations

- **Observation 1:** Plural nouns, unlike singular nouns, are associated with **CUMULATIVITY** entailments

– eg., $stars_{PL}$ is cumulative: $\star\star + \star\star = \star\star\star\star$

– eg., $(a) stars_{SG}$ is NOT cumulative: $\star + \star = \star\star$

Definition: Cumulative

P is **CUMULATIVE** when
if P is true of X and Y, then it is also true of X + Y

- **Observation 2:** Mass nouns are cumulative like plural nouns

– Eg., $water$ is cumulative: $\text{💧} + \text{💧} = \text{💧💧}$

– Eg., $fire$ is cumulative: $\text{🔥} + \text{🔥} = \text{🔥🔥}$

4.2 Link 1983's Main Theoretical Claim

- **Link 1983:** The denotation of plural nouns and mass nouns are parallel¹

¹The main claim usually associated with Link 1983 is the introduction of the **SUM**. However, since I have already mentioned that in my introductory summary, I don't need to worry about not presenting it right away here.

1. Plural noun denotations are structured by **SUM-FORMATION** \oplus which acts on individual atoms
2. Mass noun denotations are structured by **MATERIAL-FUSION** \oplus which acts on material

- Both of these operations satisfy **CLOSURE** and **UNIQUENESS**, resulting in a lattice structure:

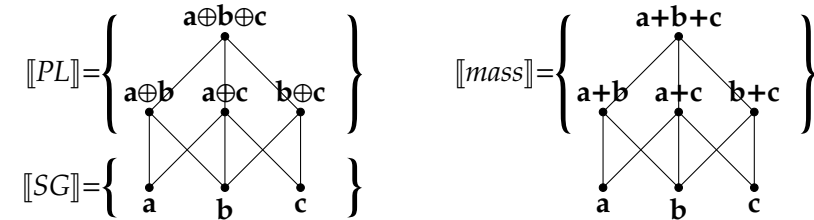


Figure 1: Lattice Structures of PL and Mass Predicates

Axiom 1: Closure

A is closed under the operation \circ ,
i.e., for any $a, b \in A$, there is an element $c \in A$ such that $a \circ b = c$

Axiom 2: Uniqueness

If $a = a'$, and $b = b'$, then $a \circ b = a' \circ b'$

- The structure/axioms generate the cumulativity entailments
- I will discuss **SUM-FORMATION**, **MATERIAL-FUSION**, and how they generate the entailments, in the following subsections

4.3 Deriving Cumulativity from the Sum-Formation Operation

- **SUM-FORMATION**

This operation forms **SUMS** from individuals

i.e., it takes individuals like **a** and **b**, and yields a sum $a \oplus b$

- The sum $a \oplus b$, unlike the set $\{a,b\}$, is the same **SEMANTIC TYPE** as a and b
- **SUMS** and their component parts are related to each other via the

PART_I-OF (\sqsubseteq) relation:

- $a \sqsubseteq a \oplus b$ "a is a part of $a \oplus b$ "
- $b \sqsubseteq a \oplus b$ "a is a part of $a \oplus b$ "
- $a \sqsubseteq a \oplus b \oplus c$ "a is a part of $a \oplus b \oplus c$ "
- $a \oplus b \sqsubseteq a \oplus b \oplus c$ "a \oplus b is a part of $a \oplus b \oplus c$ "

- Since **SUM-FORMATION** satisfies closure and uniqueness, this means :

1. $c \oplus b = b \oplus c$ (i.e., order of parts doesn't matter)
2. $a \oplus a = a$, (unlike addition, a part can't be added twice)
 $[a \oplus b] \oplus [b \oplus c] = a \oplus b \oplus c$

- **Link 1983**: The denotation of a plural noun is a set of sums, closed under sum-formation (as in figure 2)
 - If X and Y are both in the denotation of $\llbracket N_{PL} \rrbracket$...
 - then their sum $X \oplus Y$ must also be in $f \llbracket N_{PL} \rrbracket$

- **Link 1983**: The denotation of a singular noun is a set of atoms, NOT closed under sum-formation (as in figure 2)
 - If X and Y are both in the denotation of $\llbracket N_{SG} \rrbracket$, then their sum $X \oplus Y$ will be in $f \llbracket N_{PL} \rrbracket$, but not $\llbracket N_{SG} \rrbracket$

4.4 Deriving Cumulativity from the Material-Fusion Operation

- **MATERIAL FUSION**

This operation forms **MATERIAL** from individuals
 Where $a \oplus b$ is an individual (plural) object,
 $a + b$ is the *stuff/material* making up $a \oplus b$

- We can now distinguish between two "part-of" relations:

- (i) **(INDIVIDUAL) PART_I-OF** \sqsubseteq_i
- (ii) **(MATERIAL) PART_M-OF** \sqsubseteq_m

- **Link 1983**: The denotation of a mass noun is a set of non-atomic material, structured by the **PART_M-OF** \sqsubseteq_m relation (as in figure 2)
 - If X and Y are both in the denotation of $\llbracket N_{mass} \rrbracket$...
 - then their material fusion $X + Y$ must also be in $f \llbracket N_{mass} \rrbracket$

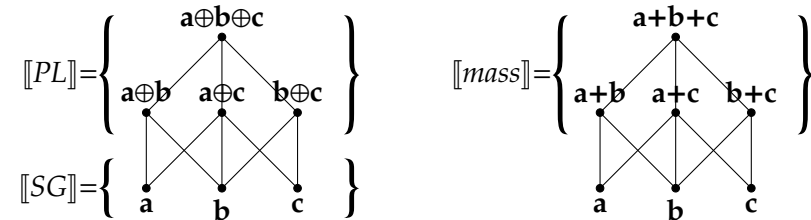


Figure 2: Lattice Structures of PL and Mass Predicates

4.5 Comparison to a Sets-Approach to Plurals

- **A Traditional Approach to Plurals:**

- (i) Singular DPs denote *individuals*
- (ii) Plural DPs denote *sets of individuals*

- We can derive the cumulativity of plural nouns with a representation of plural NPs as sets of sets of individuals

- The denotation of a PL noun is a set of sets, closed under **SET-FORMATION** (i.e., structured by the **SUBSET** relation)

- * If X and Y are both in the denotation of $\llbracket N_{PL} \rrbracket$...
- * then their union $X \cup Y$ must also be in $f \llbracket N_{PL} \rrbracket$

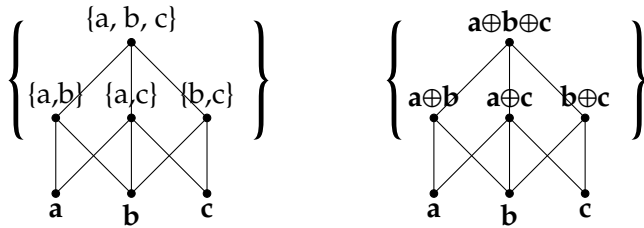


Figure 3: Lattice Structure of *D

- But mass nouns lack the atomic parts to form sets, and cannot be represented with a parallel structure
- This approach thus cannot account for the empirical parallels between mass nouns and count nouns

This is a short (2/3 pg)) handout-style summary; I abstracted away from a lot of the details of Link's proposal - eg., his formal definitions of the operations and relations, and the entire system of logic that his proposal generates.

This is suitable for introducing an audience to the basics of Link (and Link-style approaches to plurality), but lacks the details that would be proper, say, for a presentation to a semantics reading group.

That sort of summary might be 6-12 pages, and include the formalizations.

References

Link, Godehard. 1983. The Logical Analysis of Plurals and Mass Terms: A Lattice-theoretical Approach. In Ch. Schwarze R. Bäuerle & A. von Stechow (eds.), Meaning, Use and Interpretation of Language, 302–323.