

## Mass and Count at the Syntax/Semantics Interface.

In this talk, our goal is to provide a unified account of the semantic and syntactic properties of the mass-count distinction. We achieve this goal by eliminating the lexical specification of mass-count syntactic features, and by proposing an operator for count functional heads that returns individuated interpretations. Below, we describe the facts to be explained, outline our proposal, and discuss consequences for language acquisition.

**Empirical Facts:** The semantic properties of the mass-count distinction involve at least two generalizations: **Generalization 1**, some mass nouns quantify over individuals (i.e., individuate) and others do not; **Generalization 2**, nouns that can be used flexibly in either category always quantify over individuals in their count sense but never in their mass sense. The first generalization is supported by data from comparative constructions: some mass NPs behave semantically like count NPs by allowing for a comparison by number (see 1a & 1b) while others prohibit such a comparison (see 1c & 1d).

- (1) a. Seymour has more equipment than Ed.  
b. Seymour has more furniture than Ed.  
c. Seymour has more water than Ed.  
d. Seymour has more anger than Ed.

The second generalization is supported by data from mass-count flexible terms. Words like *rock* and *tile* that are equally acceptable in either category demonstrate a shift in the dimension of comparison as the category changes (as shown in 2). They quantify by number when used in count syntax, and by mass or volume when used in mass syntax.

- (2) a. Seymour has more rocks than Ed.  
b. Seymour has more tiles than Ed.  
c. Seymour has more rock than Ed.  
d. Seymour has more tile than Ed.

Theories that treat the denotations of mass nouns uniformly (Link, 1983; Bloom, 1994; Gordon, 1985) fail to account for **Generalization 1**. Theories that can account for **Generalization 1** (such as Gillon, 1992; Bunt, 1985; and Chierchia, 1998,) fail to naturally motivate the shift in sense at the heart of **Generalization 2**. On the surface, the two generalizations seem to conflict with each other. The conversion facts suggest that mass syntax removes countability whereas words like *furniture* suggest that such syntax can instantiate it.

**Theoretical Account:** In contrast to the theories mentioned above, we propose that lexical items (root nouns) are syntactically underspecified with respect to count or mass. Root nouns become count or mass only when they combine with a functional head in the syntax. Crucial to our proposal, root nouns can be interpreted as having denotations that are either countable or uncountable (we use the word *countable* here as a formal term that can be defined lattice-theoretically: A denotation is countable iff its minimal parts partition the supremum; in other words, iff its minimal parts do not overlap). The mass noun functional head does not contribute anything to the meaning of the mass noun. In contrast, the count noun head is interpreted as an operator that returns countable denotations from otherwise uncountable denotations.

The nature of the count and mass functional heads explain both of the

generalizations mentioned above. Since the mass noun head does not affect the meaning of the root, mass nouns can be interpreted as having denotations that are either countable or uncountable (**Generalization 1**). Since the count noun head converts uncountable denotations to countable ones, any root noun that can be used as a count noun, such as *apples*, *rocks*, *tiles*, *thoughts*, will necessarily have an uncountable denotation when used as a mass noun (**Generalization 2**). A somewhat controversial consequence of our theory is that even nouns that are primarily used in count syntax, such as *table*, underlyingly consist of a count functional head and a root that is associated with an uncountable denotation. We suggest that the preference for using *table* as a count noun is simply due to rules of language use rather than to a grammatical principle. Another consequence of our theory is that the count-noun head is incompatible with roots that are interpreted as having countable denotations. These roots are the same ones that yield countable denotations when used as mass nouns, namely *furniture* and *equipment*. This consequence accounts for the extreme awkwardness of *\*furnitures* and *\*equipments*.

**Concepts and Acquisition:** By our account, grammatical countability can be specified either lexically or via an operator in count syntax. Grammatical countability, however, is separate from conceptual countability. For example, a word like *table*, though conceptually countable, is not lexically countable. Instead, grammatical countability is specified syntactically by count syntax (allowing the conceptual countability to be expressed). Still, the two types of countability are tightly linked. Although not all countable things in the world are grammatically countable, all grammatically countable phenomena must be conceptually countable. In acquisition, the child's task is to discover how these two types of countability are related. First, the child must determine whether their language provides a syntactically expressed operator for expressing countability – e.g., count syntax. Second, they must determine which lexical items are specified for grammatical countability. Grammatical countability can only be represented once in an NP. If it is specified lexically, then a word cannot be used in count syntax. If it is not specified lexically, then the word can be used in count syntax so long as the derived countable expression has a corresponding conceptual interpretation. We will present evidence that children use conceptual countability and mass-count syntax to make inferences about grammatical countability. Two pieces of evidence, in particular, will be discussed. (1) Experiments involving English children demonstrate that conceptual countability interacts with syntactic cues to yield two sources of grammatical countability: one lexical and the other syntactic. (2) Experiments involving Japanese adults demonstrate a strong correlation between conceptual countability and lexical encoding of grammatical countability. By our account, this would be expected. Classifier languages like Japanese lack count syntax.

**REFERENCES:** Bunt, H. C., 1985. Mass Terms and Model-theoretic Semantics. Cambridge University Press, NY. Chierchia, G., 1998. Plurality of mass nouns and the notion of "semantic parameter". *Events and Grammar*, 70, 53-103. Gillon, B., 1992. Towards a common semantics for English count and mass nouns. *Linguistics and Philosophy*, 15, 597-640. Gordon, P., 1985. Evaluating the semantic categories hypothesis: the case of the mass/count distinction. *Cognition*, 20, 209–242. Link, G., 1983. The logical analysis of plurals and mass terms: A lattice-theoretical approach. In: Bauerle, R., Schwarze, C., and von Stechow, A. (Eds.), *Meaning, use, and interpretation of language*. Walter de Gruyter, Berlin, pp. 302-323.