

Sample puzzle answer

The puzzle:

Consider the following sentence:

(1) #Every soldier met in the hallway

What does our current system predict about the semantics of this sentence? Is its ill-formedness predicted? Explain in detail, showing all of the steps of your reasoning.

A sample answer (600+ words of prose):

In example (1), there is a VP *met in the hallway*, which is a collective VP, and a quantificational subject *every soldier*, with a singular noun, *soldier*. In this submission I show how the semantics for collective VPs defended in class and our semantics for the quantificational NP *every soldier* interact in such a way that (1) is predicted to be always false, which can, in turn, be considered the source of its ill-formedness.

First, let us introduce the semantics for collective VPs. For *met in the hallway*, we have (2), where we assume a simplified situation with just three individuals a, b, and c:

(2) $\llbracket \text{met in the hallway} \rrbracket^s = \{x: x \text{ is not atomic and } x \text{ met in the hallway in } s\} = \{ab, bc, ac, abc\}$

We have assumed that individuals can come either as atoms, such as a, b or c, or as non-atoms, such as the combinations ab, bc, or abc. The atomic individuals a, b and c are not members of (2), since they by themselves are not the kinds of things that can surround a castle. That is what we take to be the basic characteristic of collective predicates.

The second ingredient of the explanation is the semantics of *every*. *Every* introduces the subset relation (\subseteq), which must hold between two sets, P and Q (P is the sister noun to *every* and Q is the VP):

(3) $\llbracket \text{every soldier} \rrbracket^s = \{Q : \llbracket \text{soldier} \rrbracket^s \subseteq Q\}$

The third ingredient of the explanation is the semantics of singular nouns like *soldier*. In our current system, the singular noun *soldier* has the semantics in (4). I assume a small situation with just three soldiers, a, b and c:

(4) $\llbracket \text{soldier} \rrbracket^s = \{x: x \text{ is a soldier in } s \text{ and } x \text{ is atomic}\} = \{a, b, c\}$

Notice in particular that the denotation of singular *soldier* does not include non-atomic individuals. A sentence with the quantifier *every* is true whenever the set denoted by the sister noun of *every* is a subset of the set denoted by the VP. So the set denoted by *soldier* has to be a subset of the set denoted by *met in the hallway* for the sentence to come out true. In other words:

(5) $\llbracket \text{Every soldier met in the hallway} \rrbracket^s = 1$ iff $\llbracket \text{soldier} \rrbracket^s \subseteq \llbracket \text{met in the hallway} \rrbracket^s$
= 1 iff $\{x: x \text{ is a soldier in } s \text{ and } x \text{ is atomic}\} \subseteq \{x: x \text{ is not atomic and } x \text{ met in the hallway in } s\}$

It is not possible for the set of atomic soldiers to be a subset of a set that contains only non-atomic individuals (the ones that met in the hallway, in (2)). This is because for the set of atomic soldiers in (4) to be a subset of the set of non-atomic individuals who met in the hallway in (2), every member of (4) has to be a member of (2). However, no member of (4) is a member of (2)—atomic individuals are just not non-atomic ones. This analysis, then, predicts that the sentence in (1) can never be true, in any circumstance or situation, which means it is predicted to always be false.

The next issue is whether this is enough for our semantics to predict that the sentence in (1) is ill-formed. While it is plausible that, if a sentence is always false, it is perceived as ill-formed by native speakers of the language in question, the status of (1) does not seem to be the same as the status of (6), which is a sentence that can never be true but which does not seem ill-formed:

(6) All circles are rectangular

It is not clear whether (1) and (6) should be treated in the same way by the grammar, that is, that the source of what is wrong with them is the same, given that the intuition about what is wrong with (1) seems different from the intuition of what is wrong with (6). However, our system does predict that (1) should be perceived as strange by native speakers. Our grammar thus predicts that there is something decidedly strange about (1), and that may be a good enough source for its ill-formedness.