

### Counting thought: Exploring the cognitive reality of grammatical countability

The present paper tackles the question of how syntactic countability relates to the mental representation of objects and substances and proposes a uniform frame representation of lexical entries.

For centuries, researchers of many disciplines have debated whether the count/mass distinction present in many natural languages might be rooted in pre-linguistic ontological knowledge, or inversely, whether syntax might provide the foundations for conceptual development.

While there is substantial evidence against both of these claims in their strongest form ([1], [2], [3], [4]), many cross-linguist investigations suggest at least a correlation between mental representation of a noun's referent and the noun's countability feature. However, the fact that a noun's countability can vary within and across languages, especially for abstract nouns and special cases of mass nouns like aggregates (*lentils* (count) vs. *čočka* (Czech, mass)) and object-mass nouns (*furniture* (mass) vs. *meubelen* (Dutch, count)) does not suggest a one-to-one mapping of conceptual and grammatical properties [5].

The current body of research examines coercion [6, 7] in the countability domain, i.e. interpretable but grammatically incongruent combinations of determiners and nouns. We interpret these coercions as syntactically-driven metonymy and provide an account based on frames. Frames are recursive attribute-value structures assumed to be the general format of mental knowledge representation and therefore an excellent framework to model the interaction of grammatical and conceptual knowledge [8, 9].

In our account, each lexical entry consists of three interlinked sub-frames: a concept, a lemma and a phonological form, which constrain and influence each other. We assume that noun phrase processing starts with the lexical access of the determiner and an expectation about the upcoming noun's conceptual nature based on grammatical (lemma-)properties of the determiner.

For instance, when a count noun-specific determiner, such as a numeral, is encountered a noun of "individual" conceptual nature is expected (compare [10] [11] [12] for similar notions). If, however, a mass noun with non-individual concept follows, interpretation involves finding a metonymic version of the noun's meaning that matches the expectation of being an individual.

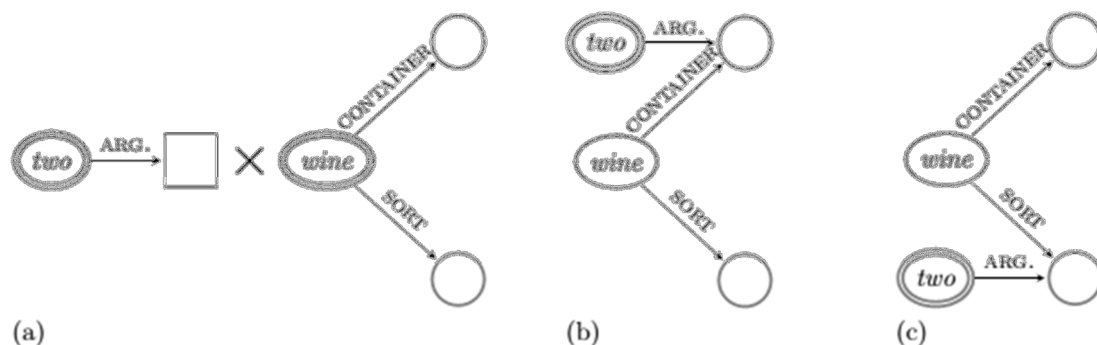


Figure 1: Simplified frame representations of examples in 1)

In our model, this coercion is accomplished by shifting the central node of the noun's conceptual frame along the attribute chain towards a node of an individual type. Noun phrase formation is accomplished by unifying the argument-value node of the determiner with a matching node in the noun frame. Contextual information provides the restrictions on which node is suitable, as exemplified in 1).

- 1) (a) Yesterday, I had too much wine at the bar. (= wine as substance)
- (b) Yesterday, I had two wines at the bar. (= two glasses)
- (b') Yesterday, I bought two wines at the supermarket. (= two bottles)
- (c) Yesterday, we tried two wines from the local winery. (= two sorts)

Similarly, we assume that the general representation of concepts is stable across languages, but that the choice of central node (that is default interpretation) is language dependent. During our talk, we will present the explanatory power of the outlined approach using diverse, more complex examples.

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