Incomplete Meaning Processing: Moses Illusion And Metaphor Understanding

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EXTENDED ABSTRACT

This talk will present an ACT-R model that unifies two phenomena in text comprehension: Moses illusion and metaphor understanding.

Empirical data about Moses illusion shows that, in about 45% of cases, people are not able to detect distortions in sentences like *How many animals of each kind did Moses take on the ark?*, in spite of being instructed to look for distortions and in spite of knowing that it was Noah and not Moses the one who took animals on the ark. On the other hand, studies in the metaphor comprehension literature prove that sometimes metaphors are easier to be understood when the context precedes them; that is, sentences like *The sky is filled with drops of molten silver* are less difficult than Drops of molten silver filled the sky (Gerrig and Heally, 1983).

The model I will be talking about regards both Moses illusion and metaphor comprehension as instances of incomplete meaning processing. Specifically, word meanings are represented as consisting of a number of features. Each time a word is processed, only few of these features are actually retrieved. The context in which the word appears (if existent and strong enough) guides the extraction of features. However, if a strong context does not exist (for instance, if we are at the beginning of the sentence), the features extracted from each word are used to find the right context in memory. Therefore, the model always has a candidate context for the current utterance.

Thus, for Moses illusion sentences, since the distorted word (*Moses*) is processed only superficially, there are quite strong chances that the features retrieved will match features extant in the representation of *Noah* (given that *Moses* and *Noah* share some salient attributes), and thus the distortion will remain unnoticed.

On the other hand, a metaphoric sentence like *The sky was filled with drops of molten silver* can be regarded as a distorted sentence (in the sense of Moses illusion), with the metaphor being the distortion. Given that the information preceding the metaphor is rich enough, it is possible to find the right context in which this sentence could be put. Thus, the features common to *drops of molten silver* and *stars* are readily retrieved.

In the same way, the metaphoric sentence *Drops of molten silver filled the sky* can be considered to be distorted, with the distortion *the sky*. However, the context evoked by the words preceding *the sky* cannot accommodate *the sky* itself (because presumably there are no common features between something that could be filled with drops of molten silver in the literal sense and the meaning of the word *sky*). Therefore, the listener needs to reconsider the entire

sentence and look for another plausible context that satisfies all the data.

It is interesting to notice that the model presented does not necessarily entail a stage processing of the metaphors, (i.e. a literal interpretation first, followed by a metaphorical interpretation), although in some situations it does mimic such a behavior. Only the lack of a good context and the common meaning of words like *drops of molten silver* etc. drive the model to look for a literal context first.

The model predicts successfully the illusion rates for the Moses illusion tasks and the latency ordering for the metaphor comprehension task.

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