The exhaustive interpretation of the Hungarian pre-verbal focus: entailment or implicature?

Through two eye-tracking experiments, the study investigates eye movement patterns associated with semantic entailment *versus* pragmatic implicature, and the semantic or pragmatic nature of the meaning conveyed by placing a constituent immediately before the finite verb in Hungarian (pre-verbal focus, pre-VF). While it is a fact that Hungarian pre-VF may be interpreted exhaustively, i.e., the constituent before the verb may be interpreted as the only entity to which the predicate applies, the status of this exhaustive interpretation is subject to debate. Traditional accounts (e.g. É. Kiss 2004; Kenesei 2006) consider the exhaustive interpretation to be semantically determined (i.e., an entailment), while an alternative pragmatic account proposes that exhaustiveness is a context dependent pragmatic phenomenon and it is implicated rather than entailed (i.e., an implicature).

The pragmatic view is supported by empirical evidence demonstrating that pre-VF is neither necessarily used with an intention to convey exhaustiveness nor necessarily exhaustively interpreted. In a picture—sentence verification paradigm, Kas & Lukács (2013) found that although object focus sentences were more readily rejected in non–exhaustive contexts than subject focus sentences, both types were accepted to a considerable rate. Gerőcs et al.'s (2014) experiments looked at object focus using two different paradigms. In one experiment, participants were instructed to select from a set of pictures all those that matched a given sentence. The set of pictures included both an exhaustive and a non-exhaustive interpretation of the sentence. In this paradigm, participants were considerably more tolerant of non-exhaustive interpretations of object focus than in Kas & Lukács's forced choice paradigm. The other experiment by Gerőcs et al. compared the semantic and the pragmatic account more directly and rested on the assumption that the derivation of an implicature requires extra cognitive effort relative to the processing of an entailment (Sperber & Wilson, 1995). By imposing a time limit on responses in a picture--sentence verification task the authors found that participants who had a very short time to respond were substantially less likely to interpret pre-VF sentences exhaustively than participants who were given a longer time limit. The authors conclude that exhaustive interpretation is the result of an implicature, which, contrary to the semantic meaning, is not generated if the processing system is denied the necessary resources.

All of the above experiments look at off-line data (the distribution of responses), since reaction time cannot be measured because of the crucial difference in the word order of pre-VF *versus* neutral sentences. In offline tasks, however, only the 'end product' of an interpretational process can be measured but not its progress. In an attempt to improve the methodological tools used to investigate Hungarian pre-VF interpretation and contribute online data to the debate, we developed an eye-tracking experiment using the visual word paradigm in which processing related information is – at least indirectly – accessible.

In this experiment we compare the interpretation of lexically marked focus (e.g. *Csak a kivit vágta félbe - She split the kiwi only*), pre-VF (*A kivit vágta félbe - It was the kiwi she split*), and neutral sentences (*Félbevágta a kivit - She split the kiwi*). In each critical trial participants listened to one of the three types of sentence and were shown a set of four pictures simultaneously: one depicting an exhaustive scenario, an alternative non–exhaustive image, and two distractors. Participants had to choose the image best representing the meaning of the sentence. The choice of image (behavioural data), and the ratio of dwell time on the target image to dwell time on the alternative image (eye tracking data – DT) were recorded. We expected lexically marked focus to be unambiguously interpreted as being exhaustive, pre-VF to show some ambiguity in the choice of exhaustive *versus* non-exhaustive interpretation and neutral sentences to be unambiguously interpreted as being non-exhaustive.

Since it was not clear what dwell-time pattern we should expect corresponding to the behavioural predictions, a baseline measurement was made comparing the interpretation of pairs of sentences containing NPs coordinated with *and* versus *or*. These connectives were taken to be a reliable basis for the distinction between semantic and pragmatic processes, since Fekete et al. (2013) had shown in an online shallow processing picture–sentence verification experiment that the interpretation of *and* is semantically determined, while the interpretation of *or* is tied to the pragmatic process of implicature derivation.

The method of our baseline experiment was the same as the method of the visual-world focus experiment except that the sentence conditions were conjunction (*He split the kiwi and the orange*) and disjunction (*He split the kiwi or the orange*), and the critical pictures presented corresponded to an inclusive (both objects split) and an exclusive (one of the objects split) interpretation. The comparison of the two connectives in our baseline visual-world experiment provided the expected results: the behavioral data show that participants uniformly interpret *and* coordinated NPs inclusively, while in the case of *or,* interpretations vary between the inclusive and the exclusive meaning. For the analysis of the eye movement data we compared the proportion of dwell-time on the incongruent image in the *and*-condition (i.e. exclusive image) with the proportion of dwell-time on the incongruent image in the *or*-condition (i.e. inclusive image) in trials where participants gave a congruent response in both conditions. We found that DT on the incongruent image was significantly lower (Mean = 26%) in the *and*-condition than in the *or*-condition (Mean = 37%) (t(21) = 3.791, *p* = .001) suggesting that the ambiguity of interpretation associated with a construction that may give rise to an implicature can be captured as hesitation shown by the dwell time divided between the two response options being considered.

Based on the baseline experiment, we expected the pre-verbal focus sentence condition to show an eye-movement pattern similar to the disjunction condition and the lexically marked focus sentence condition to show an eye-movement pattern similar to the conjunction condition. Our preliminary results, however, show an unexpected pattern: participants gave an exhaustive interpretation to all sentences in all conditions (behavioral data). Just as interestingly, the eye movement patterns were similar in all three conditions: there was no significant difference between the proportions of DT on the incongruent (non-exhaustive) image (36-38%) suggesting that the alternative non–exhaustive image was excluded with similar levels of hesitation during processing. The data gathered so far are at odds with previous findings and further investigation is needed to find an explanation for the discrepancy. A possible modification to the experimental procedure is to allow participants to select all the pictures they find compatible with the sentence stimulus rather than requiring them to select only one.

References

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