2.10 Processing syntactic ambiguities and the effect of pragmatic context

Hoeks J.C.J., Stowe L.A., Wijers A.A., Wunderink C.

Hoeks, Vonk, & Schriefers (2002) showed that pragmatic information determining the topic of the next sentence (topic = "what the sentence is about") can eliminate processing difficulty in a locally ambiguous "gardenpath" sentence with an unpreferred syntactic structure. For instance, a sentence such as *The actress cursed the director and the producer ...* is temporarily ambiguous: it can continue as an NP-coordination (1a), but also as an, unpreferred, S-coordination (1b).

1a. NP-coordination: The actress cursed [the director and the producer] loudly
1b. S-coordination: [The actress cursed the director] and [the producer laughed]

In sentences like these, a preceding context in which you expect to receive information about both the actress AND the producer makes the S-coordination ending much easier to process, whereas in a neutral context, the NP coordination is easier. To investigate whether the use of pragmatic information could *create* a garden path, an ERP experiment was conducted using the same temporarily ambiguous sentences which were eventually disambiguated in favor of the usually *preferred* syntactic structure (i.e., NP-coordination). These locally ambiguous sentences were preceded either by a context biasing towards the non-preferred reading (i.e., S-coordination) as in 2a, after which the reader expects information about both persons, or by a neutral context, as in 2b, where no specific expectation is created.

2a. Biasing Context: "What did the actress and the producer do?"
Target sentence: "The actress cursed the director and the producer loudly."

2b. Neutral Context: "What happened?"
Target Sentence: "The actress cursed the director and the producer loudly."

Figure 1 shows the results for three selected electrodes: the left frontal F7, the midline parietal site Pz, and the right frontal F8. The graphs show the waveforms recorded over a region of three words, namely "the producer loudly". Please note that the baseline was calculated over the entire duration of the first word 'the' of this three-word region. The reason for this was the apparent N400 effect at the word producer, due to repetition (see 2a), that would affect the results of a baseline calculation just before the critical word loudly.

As can be seen in Figure 10, the pragmatic context biasing toward the non-preferred reading elicited an early left negativity (accompanied by an early parietal positive peak) followed by a late centro-parietal positivity (P600) at the point of disambiguation. These responses are typically found when sentences are either ungrammatical, or turn out to have the less preferred structure. The results of the present study thus suggests that pragmatic information is used extremely fast in on-line sentence processing and that it can induce effortful syntactic (re-)processing even in sentences with the "preferred" syntactic structure.

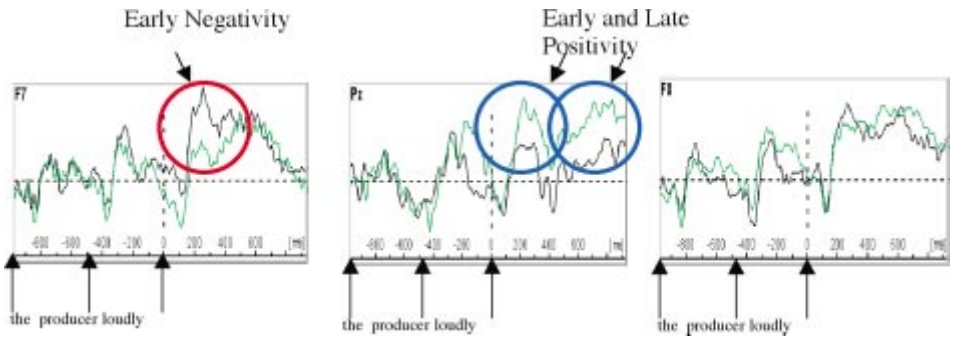

Figure 10 ▸ The effect of a mismatch between pragmatic context and structure of the target sentence. Black lines represent the neutral control condition, green lines are the mismatch condition. Y-axis represents voltage (each mark is one microvolt, negative is down); X-axis represents time (in milliseconds). Arrows indicate when the critical words of the target sentence are presented.