

Reversing expectations during discourse comprehension
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Supplementary Materials

Experiment 3

Material, participants and procedure

The same 90 sets of plain scenarios as those used in Experiment 1 and 2 were used in this experiment. However, the even-so scenarios were omitted. Two experimental lists were created, using a Latin Square design. Each participant saw 90 plain scenarios in total (45 coherent and 45 incoherent). Sixteen individuals participated in this study. They carried out the same comprehension task as used in Experiment 2, and all other experimental procedures were the same as those described in Experiment 2.

Results

The comprehension accuracy for the coherent and incoherent scenarios was 87.5%, and 84%, respectively. The difference was not significant ($t(15)=1.1, p>.2$).

Critical word: Analyses on the critical word were carried out across the same two time windows as those used in Experiments 1 and 2: 350-450ms (N400) and 600-800ms (P600). As shown in Figure 1 below, there was no coherence on the N400 (mid-regions: $F(1,15)=0.2, p>.6$; peripheral regions: $F(1,15)=.05, p>.8$). This result replicates the absent N400 effect of coherence on the critical words of the plain scenarios in Experiment 2. We also found no effect of coherence on the P600 (mid-regions: $F(1,15)=1.4, p>.2$; peripheral regions: $F(1,15)=1.28, p>.2$).

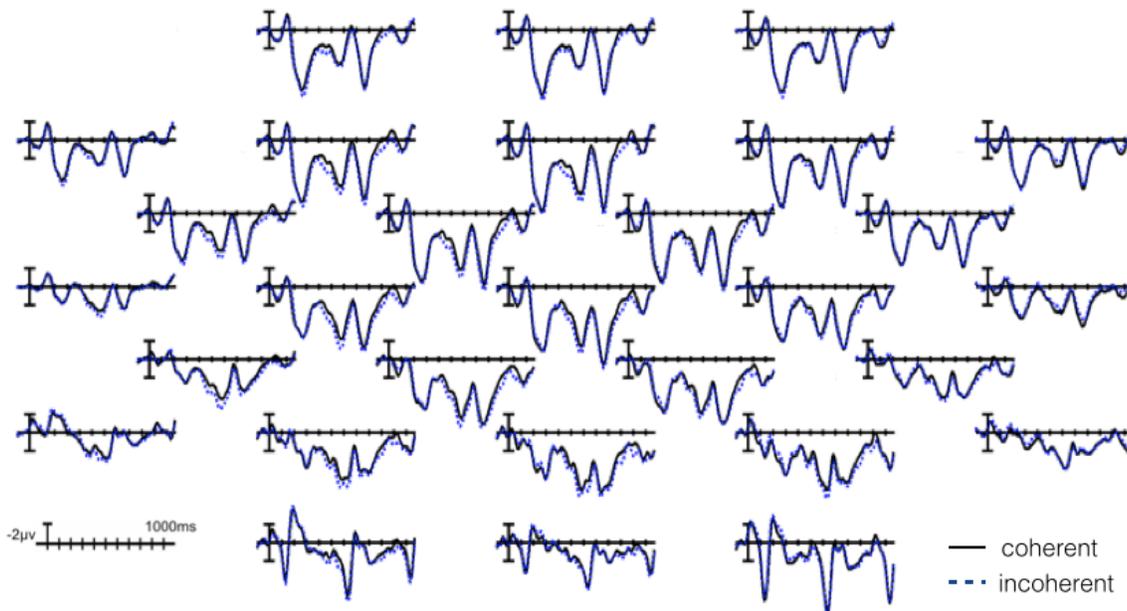


Figure 1: ERP waveforms at the critical word.

Sentence-final word: We observed a larger prolonged negativity on final words of the plain incoherent than the plain coherent scenarios. This effect was significant between 300-600ms over the mid-regions ($F(1,15)=4.8, p<.05$) and it approached significance over the peripheral regions ($F(1,15)=3.7, p<.08$). This replicates the findings on sentence-final words of the plain scenarios in both Experiment 1 and 2.

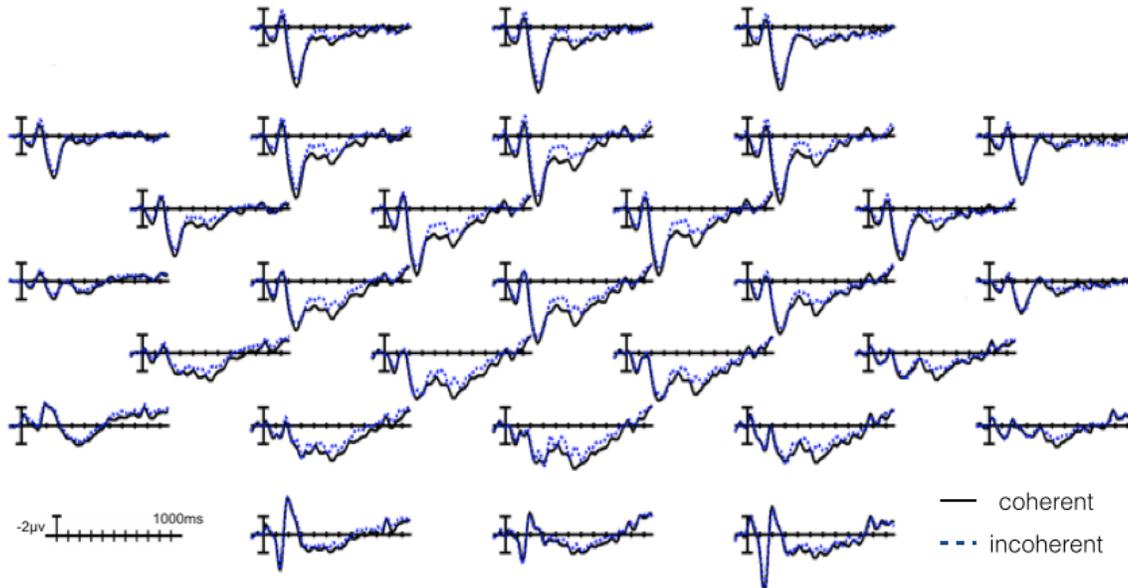


Figure 2: ERP waveform at the sentence final word

Analysis combining participants from Experiment 2 and 3

A potential concern is that the lack of a N400 effect in Experiment 2 may be due to the smaller number of participants (20 vs. 27 from Experiment 1), and hence less statistical power in Experiment 2. To address this concern, we pooled the data from Experiment 3 and the ERPs to the two plain scenarios from Experiment 2, resulting in a total of 36 participants, exceeding the number of participants in Experiment 1. The analysis on the combined data still did not reveal any sign of a N400 effect between the 350-450ms window. Neither the main effect of Coherence nor the interaction between Coherence and Region is significant for the mid-region (Coherence $F(1,35)=0.5, p>.4$; Coherence x Region $F(4,140)=0.7, p>.5$). For the peripheral region, we also found no main effect of Coherence ($F(1,35)=0.02, p>.8$), no interaction between Coherence and Region ($F(1,35)=0.3, p>.8$), and also no three-way interaction Coherence x Region x Hemisphere ($F(1,35)=1.9, p>.1$). Based on these results, it seems unlikely to us that statistical power could explain the absence of N400 in Experiment 2.