The effect of noise on N400

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Objectives: To evaluate the morphology of the N400 event related potential (ERP) at different signal-to-noise ratios (SNRs).

Methods: The N400 ERP was recorded from 8 subjects with normal hearing using 64 EEG channels. Semantically congruent and incongruent sentences at 65 dB SPL were presented in quiet, +10 dB SNR and +5 dB SNR.

Results: Visual and statistical analysis of the signals show a clear N400 in the quiet and +10 dB SNR. However, at +10 dB SNR the area under the curve is reduced compared to the quiet scenario. At +5 dB SNR, the N400 ERP is not visually evident.

Conclusions: The list of sentences used in this study is efficient to elicit the N400 ERP. In addition, this study shows for the first time N400 ERPs elicited in noise, thus providing a reference of this ERP at different SNRs.