

# Electrophysiological Study of the Stroop Effect

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## Introduction

Unveiling basic processes of human cognition, Stroop colour and word test is a frequently used psychodiagnostic and research tool (MacLeod, 1991). We performed the test simultaneously with P300 cognitive potentials recording.

## Method

In our experimental protocol, six healthy volunteers (4 male, 2 females), aged from 28 to 45 years were tested. Subjects were seated in a chair facing a monitor placed at 160 cm from their eyes. Their vision was normal. There were four tasks: reading words *red, green or blue*, projected onto a screen in grey letters, while the other three tasks were to name the colour (red, green or blue) in which the word was presented. Each condition consisted of 54 stimulus. Congruent stimuli were words presented in the display colour matching the word meaning (e.g. word red in red colour). Incongruent stimuli were words presented in either of the two colours not matching the word meaning (e.g. word red in green colour). Neutral stimuli were words with no meaning (*smove, avgom, mitar or vabar*) presented in any of the three colours. EEG activity was recorded with Ag/AgCl electrodes attached at the Fz, Cz and Pz sites (EEG 10-20), referenced to linked electrodes placed on the left and right earlobes; the ground electrode was fixed to the temple. The P300 was defined as the largest positive peak occurring at Cz, Pz sites within the latency window of 300 to 500 ms.

## Results

As expected, in the incongruent situation reaction times were longer, and in the congruent situation they were somewhat shorter than in the neutral situation. No effect of any of the experimental situations on P300 potentials could be seen.

## Discussion

Reaction times showed the effect of Stroop interference and facilitation in incongruent and congruent situation, respectively, while P300 was not influenced by any of the tasks. As already shown (Duncan-Johnson and Kopell, 1981), the latencies of early waves (including P300) are not affected by any of the Stroop test conditions.

## Conclusions

Obtaining the expected results at the initial stage of our research allows us to elaborate on the technical approach, eventually enabling the late evoked potentials analysis in Stroop test.

## References

- MacLeod CM. *Psychological Bulletin* 1991; 109: 163-203.  
Duncan-Johnson CC, Kopell BS. *Science* 1981; 214: 938-40.