FENS Forum 2010 - Amsterdam

- Posters: to be on display from 8:00 to 13:15 in the morning and from 13:30 to 18:45 in the afternoon. Poster sessions run from 09:30 to 13:15 in the morning and from 13:30 to 17:30 in the afternoon.
A one hour time block is dedicated to discussion with the authors (authors should be in attendance at their posters as from the time indicated.)
- For other sessions, time indicates the beginning and end of the sessions.

First author   Gerrits, Niels (poster)

Poster board F11 - Mon 05/07/2010, 14:30 - Hall 1
Session 114 - Human cognition 3
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Title   Catching the train of thoughts: unraveling dynamic changes in the brain underlying learning and memory formation

Text   The main aim of this study was to track the dynamic changes accompanying learning using behavioural responses and Event-Related Potentials (ERPs). In a previous study (Jongsma et al 2006) we observed a marked P3 decrease accompanying implicit learning. However, a close relationship between enhanced P3 amplitude and an explicit learning task was found in a study of Azizian (2007).

Auditory sequences of ten numbers (0 – 9) were presented in a systematic order (control condition) or in a pseudo-random order (learning condition) with 800 ms SOA. Each sequence was presented 6 times. After each presentation, the participant was asked to reproduce the sequence via a numerical keyboard.

With respect to the behavioral data, response accuracy was immediately close to 100% correct in the control condition. However, in the learning condition, the overall response accuracy gradually increased from 40% to almost 100% over the six repetitions. A primacy and recency-effect was observed in the learning condition. With respect to the ERP data, a clear N140, P220, N280 and P350 were observed. With respect to the N140 and P220 component, amplitudes decreased over stimuli within a sequence. In addition, the P350 increased over stimuli within a sequence. Finally, within the learning condition the P220 and P350 component increased over repetitions.

By letting participants learn a sequence over six repetitions, we tried to track the dynamics of learning. We found a strong orienting response with stimulus repetition on the N140 component. With respect to learning, we found increased response accuracy over repetitions accompanied by an increase in both the P220 and the P350 amplitude. We thus argue that the P350 reflects memory storage. This is in accordance with Azizian (2007).

Theme   F - Cognition and behaviour
Human cognition and behaviour - Learning and long-term memory