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CHANGES IN P300 LATENCY ASSOCIATED WITH VISUAL TARGET RECALL IN A SHORT-TERM MEMORY DECISION TASK

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One approach to understanding the memory processes is based on Sternberg's paradigm and asks the question of an exhaustive or a self-terminating treatment.

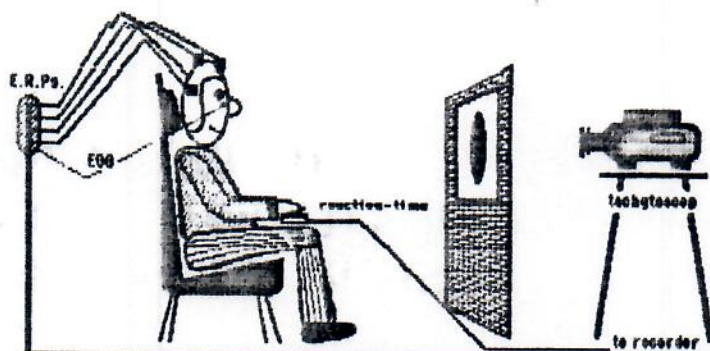
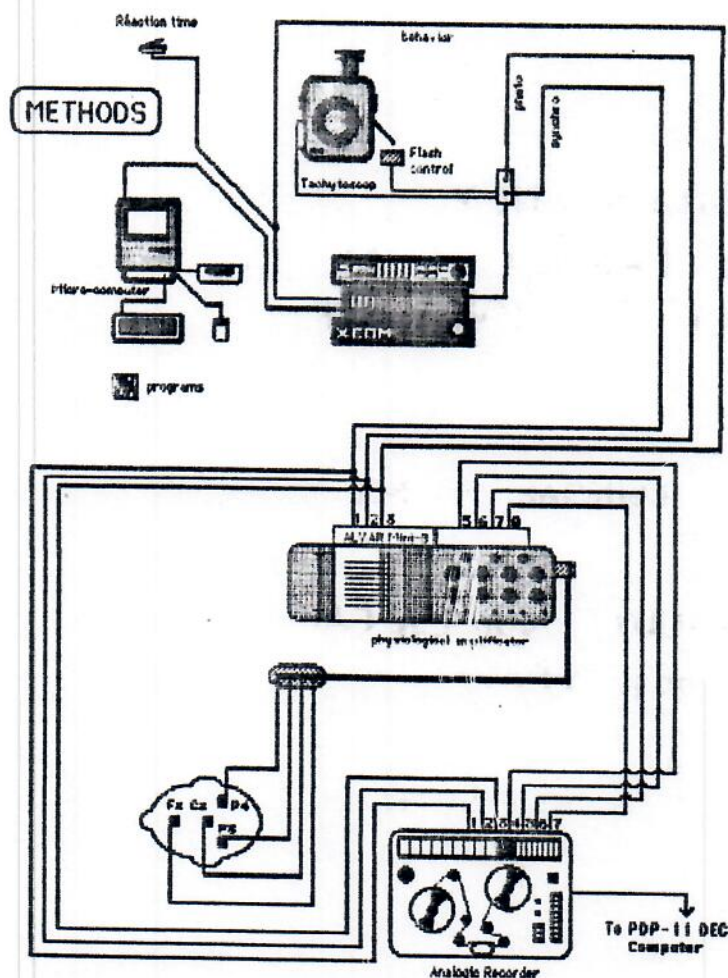
The main flow of this paradigm is using linguistic signals. Therefore it is difficult or impossible to use the Sternberg's paradigm in the exploration of aphasia pathology and senility.

We have worked out a more simple paradigm using a set of visual schematic pictures that one has to detect after learning in another set of non-target pictures. This study elicits information about the memory treatment during short-term visual recall using our paradigm, in healthy subjects.

Vertex ERPs of 9 young adult subjects (4 males and 5 females of about 25 years old \pm 5) were recorded to test this protocol before using in clinic. ERPs were obtained in two stage protocol.

- 1st: during a visual reaction-time task without order of learning (Acquisition time), when the memory sets were presented (2 sets of 9 x 9 pictures), subjects had to answer by action on a digital key when the signals went out;

- 2nd: during a detection task of the yet seen targets (Recall condition) among non-targets (Noise condition), a stimulus is regarded as a target when it belongs to the memory set (4 x 18 targets and 45 non-targets). The pictures represent objects or animals of the usual environment. The subjects only had to respond when the targets went out.



Subjects :

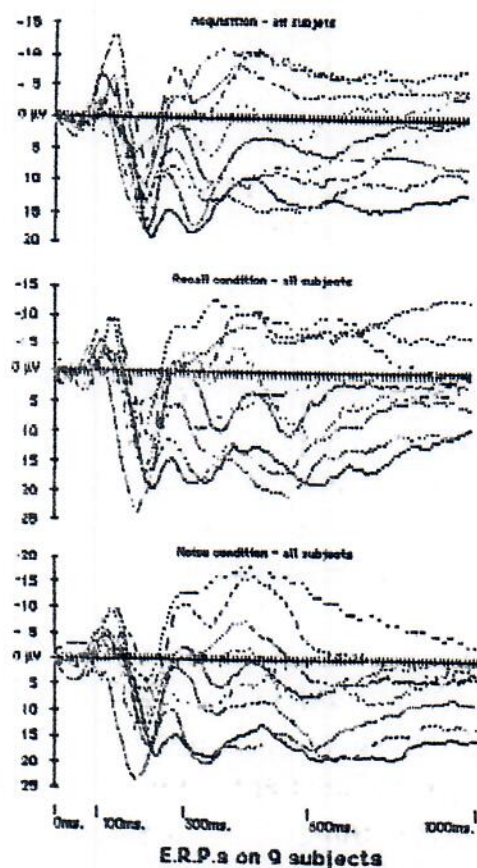
9 young subjects (25 years \pm 5)
4 males and 5 females
without pathology

Stimulations :

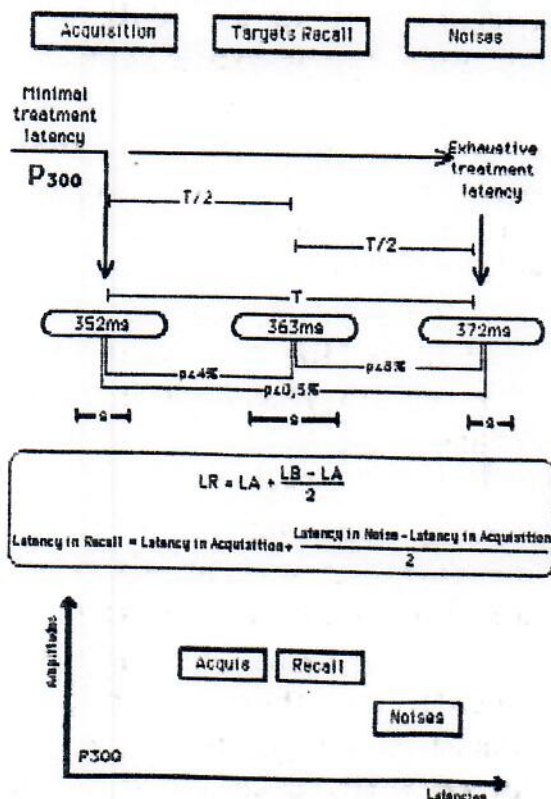
2 series of 9 simple semantic pictures
as targets and
45 similar pictures as non targets

Task :

1st learning of the first series of targets 15mn.
2nd learning of the second series 15mn.
3rd presentation of all the pictures and
recall of the targets (1st and 2nd series) 30mn.
subject must press a RT-key when detecting
a target among the noise pictures



RESULTS on P3 (Cz)



The most important results show that there are differences in P300 latencies in the 3 conditions (Acquisition, Recall, and Noise).

These results may be summarized as follows:

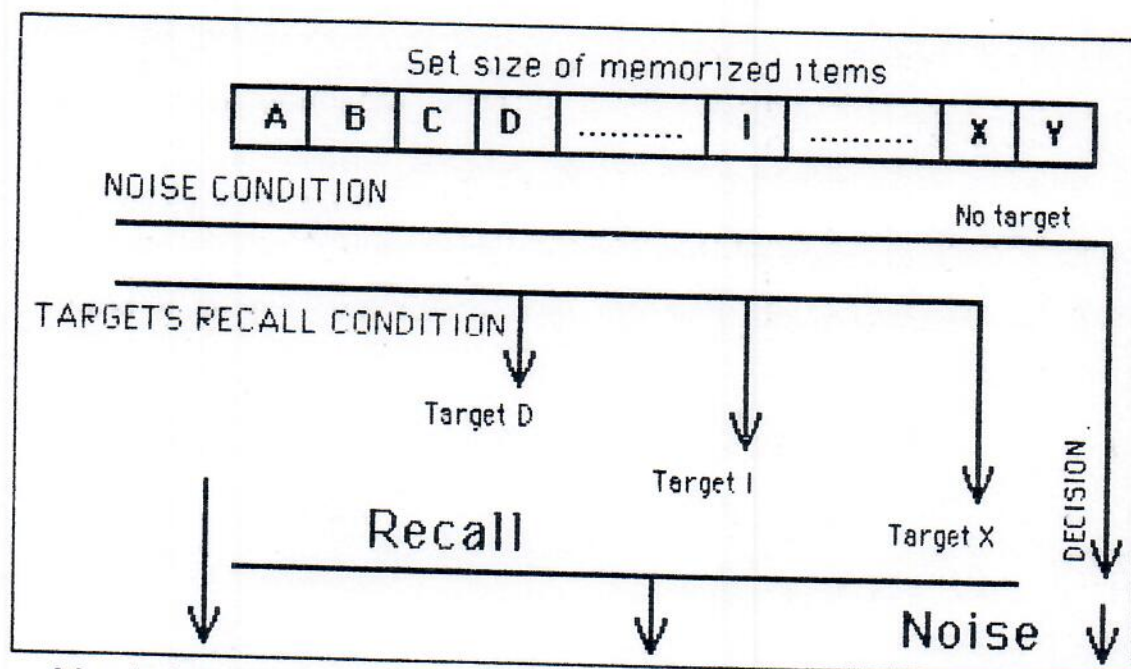
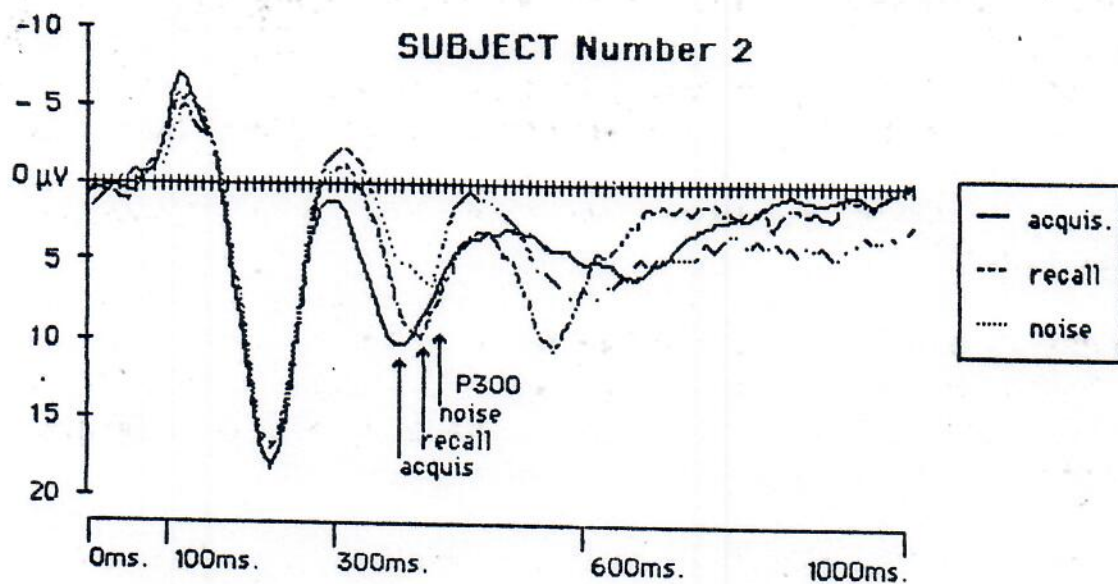
- Acquisition stimuli elicit short P300 latencies (352ms±23);
- Noise condition presents long P300 latencies (372ms±22);
- Recall condition shows intermediate latencies (363ms) with a more important variance (s=34).

These values are different with a probability of 0,4% (Acquisition-Noise), 3% (Acquisition-Recall), and 8% (Recall-Noise) (Wilcoxon non-parametric test).

These findings indicate that P300 component of the ERPs can be used to evaluate the memory processes which are used in our visual paradigm, and suggest a self-terminating treatment of this type of simple items.

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Model of the self-terminating processes in the short-term visual recognition paradigm