



**HAL**  
open science

## Changes in P300 latency associated with Visual Target Recall in a Short Terme Memory Task

Bernard Claverie, Bernard N'kaoua, Jean-Luc Cadiot, Robert Jaffard, Jacques Paty

► **To cite this version:**

Bernard Claverie, Bernard N'kaoua, Jean-Luc Cadiot, Robert Jaffard, Jacques Paty. Changes in P300 latency associated with Visual Target Recall in a Short Terme Memory Task. International Conference of Cognitive Neuroscience - ICON 4, Jun 1987, Dourdan, France. hal-04527887

**HAL Id: hal-04527887**

**<https://hal.science/hal-04527887v1>**

Submitted on 31 Mar 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

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

I.C.O.N. 4 - June 15-19, 1987- DOURDAN - FRANCE

**Bernard CLAYERIE<sup>1</sup>, Bernard N'KAOUA<sup>2</sup>, Jean-Luc CADIOT<sup>3</sup>  
Robert JAFFARD<sup>2</sup> & Jacques PATY<sup>1</sup>**

<sup>1</sup> - Laboratoire de Médecine Expérimentale - Université Bordeaux 2

<sup>2</sup> - Laboratoire de Psychophysologie - Université Bordeaux 1

<sup>3</sup> - LARSACT - IUT-A - Université Bordeaux 1

<sup>1</sup> - BP40 - Carreire - 33076 BORDEAUX cédex (France)

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.



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.

#### BIBLIOGRAPHIE :

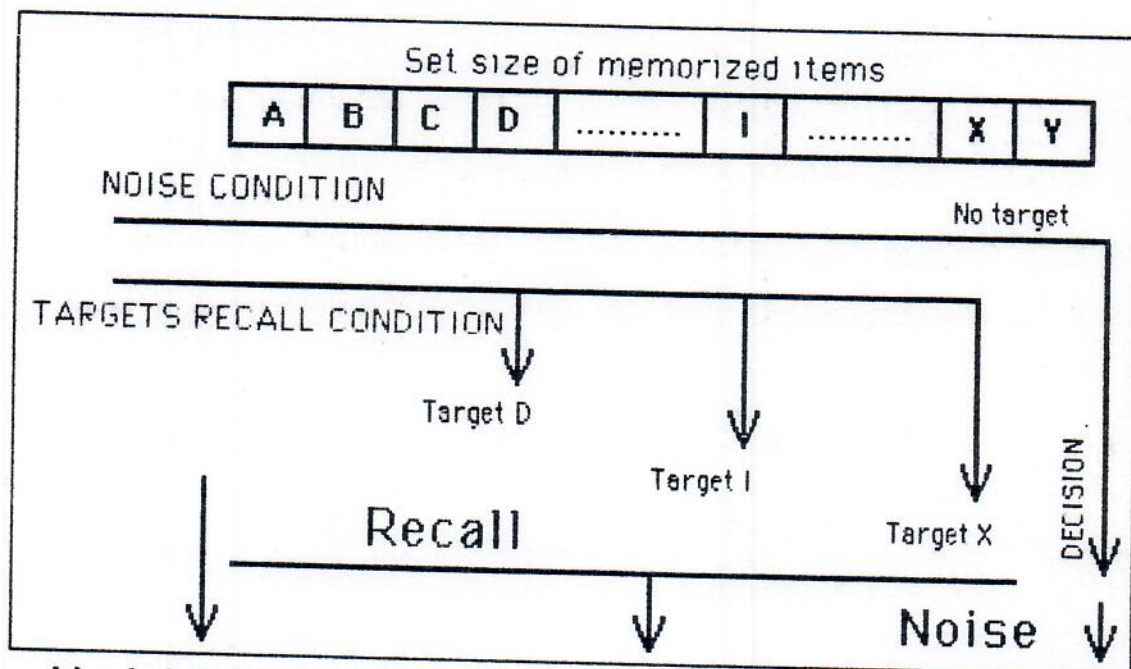
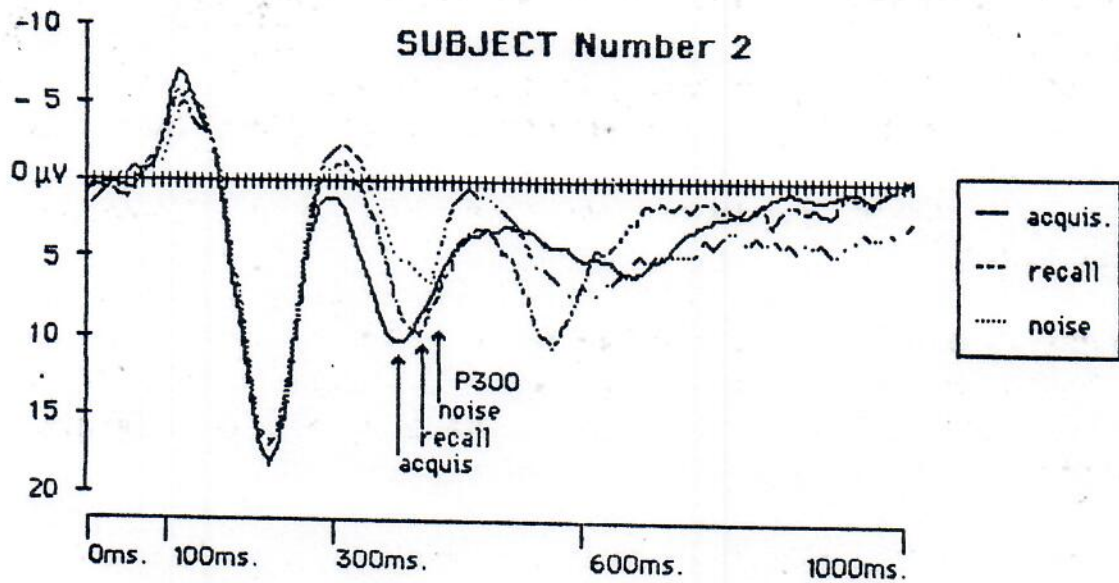
- Adam, N., & Collins, G. (1978) Late components of the visual evoked potential to search in short-term memory. *Electroencephalography & Clinical Neurophysiology*, 44: 147-156.

- Ford, J.M., Mohs, R.C., Pfafferbaum, A., & Koppel, B.S. (1980) On the utility of P300 latency and reaction time for studying cognitive processes. In H.H. Kornhuber & L. Deecke (Eds.), *Motivation, motor and sensory processes of the brain: electrical potentials, behavioral and clinical use. Progress in brain research* (Vol. 54, pp. 661-667). Amsterdam: Elsevier.

- Sternberg, S. (1966) High-speed scanning in Human memory. *Science*, 153: 652-654.

- Theios, J., Smith, P.G., Haviland, S.E., Traupman, J. & May, M.C. (1973) Memory scanning as a serial self-terminating process. *Journal of experimental psychology*, 97: 323-336.

- Timsit-Berthier, M. (1984) Variation Contigente Negative et composantes endogènes du potentiel évoqué. *Revue E.E.O. Neurophysiol.*, 14: 77-96.



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