Spatial Representation in Motor Control Studied in Differently Treated Schizophrenic Patients

C. Bourdet (BOURDET@IDF.EXT.JUSSIEU.FR)
V. Caulliez, J.M. Foucault, A. Rossetti, A. Manus, Y. Rossetti***
Service de Psychiatrie, Hopital Albert Chenevier, Creteil
* INSERM U94, Bron; ** CHS Lyon-Vinatier, Bron - FRANCE

Spatial representation in action was studied by analysing pointing performances in a specially elaborated motor task requiring memorization of proprioceptive targets.

We measured errors made during hand-pointing to locations previously encoded with the other hand (without visual control). These locations were presented in a sagittal plane, on an arc centered on starting point, by a brief passive positioning of the left index finger. A go-signal for matching target location with the rigth index finger was provided 0 or 8 s later.

Inpatients, diagnosed by DSM-IV and CIM-10 criteria as having schizophrenia, were engaged in the procedure and compared to a group of ten normal subjects age, sex, and handedness matched. The patients were under different neuroleptic treatement with a stable dose for at least three months. Their ages ranged from 31 to 45 years, the mean age being 33,2 years. The hospitalisation durations ranged from 0 to 48 months, the mean duration being 13,7 months. Subjects were all screened for the following exclusion criteria: evident organic pathology; neurologic illness including epilepsy, neuromuscular disease, or history of head injury with loss of consciousness; alcohol or substance abuse. Informed consents were provided.

In order to look for correlations between the experimental and clinical parameters, psychometric tests (WAIS-R, WCST, Trail-Maiking Test, Stroop Interference Test, Mental Rotation Test, MMPI) and psychiatric scales (BPRS, PANSS, MADRS, Simpson and Angus) were performed. Ratings were completed by trained members of the research team who were unaware of the task performance of subjects.

The first results showed that:

1) Pointing variability increased with delay in both groups, but was about fourfold higher in patients for both delays.

2) In control subjects, the main axis of the pointing distribution is aligned with the target array for the 8 s (102°) but not after 0 s (127°), demonstrating the capability of using a contextualized mental representation in the delayed pointings (Rossetti & Regnier, 1995). None of the treated schizophrenic patients showed a similar tendency: the mean orientation of pointing distribution was 128°(0 s) and 143°(8 s). These results suggest that patients are not able to use the contextual information provided by the target array, to point each target.

This experiment allows to discuss in schizophrenia the differential performances between immediate stimulus-driven behaviours and behaviours guided by an internal representation (Frith, 1992). Besides, interaction between neuroleptic treatment and motor performances are discussed.

References

Rossetti, Y., & Regnier, C. (1995). Representations in action: Pointing to a target with various representations. In B. G. Bardy, R. J. Bootsma, & Y. Guiard (Eds.), *Studies in perception and action III*. Mahwah, NJ: Lawrence Erlbaum.

Frith, C. D. (1992). *The cognitive neuropsychology of schizophrenia*. Howe (UK), Hillsdale (USA): Lawrence Erlbaum. Translated by B. Pachoud & C. Bourdet, 1996, PUF, Paris, FRANCE.