

# VISUAL SEARCH PERFORMANCE AND PSYCHOPATHOLOGY IN ACUTE AND REMITTED SCHIZOPHRENICS

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Recent evidence point to the syndrome specificity of attentional deficits in schizophrenia on various tasks, especially those of visuomotor performance (Gaebel, W., Ulrich, G., & Frick, K., 1986; Gaebel, W., & Ulrich, G., 1987). Deviations have been reported in eye movement research in elementary eye movement components, e.g. prolonged fixation duration, particularly in chronic schizophrenics with negative symptoms. The present study aimed at a replication and extension of these findings in a visual signal noise discrimination task.

**Methods:** 20 schizophrenic inpatients admitted as acute (mean age 33,5 +/- 11,3 years, 50% men) as diagnosed according to Research Diagnostic Criteria, were instructed to search for a randomly located target letter (Z) in 10 lists of 284 distractor letters of rounded (R) or angular shape (A) projected on a screen (23°x15°). Eye movements were recorded using infrared corneal reflection pupil-center measurement (DEBIC 80). Search performance was defined as the search time in seconds from onset of the display until localization of the target. Search times were averaged for the five lists with R and A distractor letters respectively. The same procedure was applied to basic eye movements parameters: total number of fixations (TNF), mean duration (ms) of a single fixation (MDF) and mean scan path (distance) between successive fixations (MSP). Fixations were determined by calculating a running mean for eye position. A single fixation was defined to represent at least 10 consecutive gaze-positions ( $\geq 200ms$ ) within a predetermined window. - Assessment took place shortly after admission (T1) and before discharge (T2). The psychopathological status was assessed at the same time with the Brief Psychiatric Rating Scale (BPRS). All patients were medicated with neuroleptics at T2.

**Results:** The BPRS total score decreased significantly from T1 to T2 ( $p = .0001$ ). However, the mean search time (ST) did not change over time with remission and revealed a persistent dependence on task difficulty ( $ST/A > ST/R$ ,  $F_{1,19} = 15,57$ ,  $p = .001$ ). For both paradigms TNF correlated highly with ST ( $r = .89$  to  $.97$ ,  $p = .0001$ ). Concerning the basic eye movement components, MDF and MSP were persistently negatively correlated ( $r = -.52$  to  $-.74$ ,  $.05 > p < .001$ ). Consequently the group was split according to opposite eye movement (EM) patterns: 10 individual (G1) fell below the grand mean of MDF (331,4 +/- 34,9 ms) and above the grand mean of MSP (62,3 +/- 17,1) and 10 individuals behaved viceversa (G2). The EM pattern of Group 1 (G1) ("extensive scanning") and Group 2 (G2) ("staring") was stable over time. At T1, G2 scored higher in emotional withdrawal ( $T = 2,56$ ,  $p < .05$ ). Concerning

search time, an interaction effect emerged between time point (T1, T2) and group (G1, G2) for R only ( $F_{1,19} = 6.16, p < .05$ ). Accordingly, search time improved with remission particularly in G2.

**Conclusion:** Search performance in schizophrenics as measured by global search time is highly related to the number of fixations. This relationship is heavily affected by task difficulty, which is reflected by target/distractor similarity. Since there is no change in mean search time over time the conclusion could be drawn the search performance is independent of improvement in psychopathology. However, in accordance with previous findings, two relatively time stable trait-like EM patterns in schizophrenics can be distinguished which are differently related to psychopathology and performance measures. The relationship between staring behavior, emotional withdrawal, and poorer search performance (R) in the acute illness phase points to a state-specific regulation of negative symptoms and attention in a clinical subgroup, which is characterized by restricted scanning. Because of the stability of this EM pattern, attention seems to be regulated by varying the width of the functional visual field.

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