Attentional performance in schizophrenic patients: An Eye tracking study.

Cognition Day 2015

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Schizophrenia

Schizophrenia is a heterogeneous mental disorder including several cognitive deficits and is widely thought to involve impairments of attention functions.

- Emil Kraepelin (1856–1926): ‘dementia praecox’ - “early onset dementia”
- Eugen Bleuler (1857–1939): ‘the group of schizophrenias’

“schizein”, to split and “phrên”, spirit

Problematic diagnosis and etiology.
Schizophrenia

DSM-5 - Diagnostic and Statistical Manual of Mental Disorder

Symptoms

Two or more of the following for at least 1 month (unless successfully treated):

- Delusions
- Hallucinations
- Disorganized speech
- Disorganized or catatonic behaviour
- Negative symptoms (eg. Avolition, affective flattening, alogia)
Attention

William James

- Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatterbrained state which in French is called distraction, and Zerstreuheit in German.

The Principles of Psychology (1890)
Research Questions

Luck and Gold (2008),

- impaired attentional performance in schizophrenia is due to **rule selection and how to use this selection**
  
  ➢ **Explicit Rule.**

Rule activation in schizophrenic patients and dimension-based changes of the target definition in search for feature targets were shown to be associated with the frontal cortex, we hypothesized that:

**schizophrenic patients may exhibit difficulties switching between dimensions and between target and absent trials, which we considered implicit rule changes.**

(Maljkovic & Nakayama, 1994; Krummenacher & Müller, 2012)
Popout Task

240 displays:
- 4 blocks, 60 trials per block.
- Present / absent trials ratio: 60% / 40%
Intertrial conditions

<table>
<thead>
<tr>
<th>Trial n-1</th>
<th>Trial n</th>
<th>Description</th>
<th>RT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No dimension change</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Dimension change</td>
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<tr>
<td>No target</td>
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<td>Absent -&gt; Present trial</td>
<td>RT</td>
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<td></td>
<td>No target</td>
<td>Present -&gt; Absent trial</td>
<td>RT</td>
</tr>
</tbody>
</table>
Behavioral results

Manual RT by dimension changes

- RT Schizophrenic Group >> RT control
- RT Absent trial >> RT present trials (Both groups)
- 40 ms intertrial gain found in the control group
The number of fixations is significantly larger in the schizophrenic group, with the persistence of numerous fixations when it is an absent trial.
Gaze Pattern toward the target by target circle positions

Circle 1

Circle 2

Circle 3

Schizophrenic Group
Conclusion

- Disorganized search pattern.
- No dimension based gain => deficit in the implicit rules.
- “Binding Problem”: difficulties in linking informations from different brain areas
- Short-term memory impairments
Thank you for your attention!!