

horizon sud  
fondation



Unil  
UNIL | Université de Lausanne

Institut et Haute Ecole de la Santé  
La Source  
Lausanne

The logo for La Source Lausanne consists of the text 'La Source Lausanne' in a blue, sans-serif font. To the right of the text is a stylized graphic element resembling a white 'L' or 'U' shape with a red cross on its right side.The logo for the University of Fribourg features a blue square containing a white grid of triangles. To the right of the square, the text 'UNIVERSITAS FRIBURGENSIS' is written in a small, blue, sans-serif font.

UNIVERSITAS  
FRIBURGENSIS  
UNIVERSITÉ DE FRIBOURG SUISSE  
UNIVERSITÄT FREIBURG SCHWEIZ

# Attentional performance in schizophrenic patients: An Eye tracking study.

**Cognition Day 2015**

**M.Sc. Géraldine Jean-Charles**

**Prof Dr. Chantal MartinSoelch**



PHILOSOPHISCHE FAKULTÄT

philosophische

---

# 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

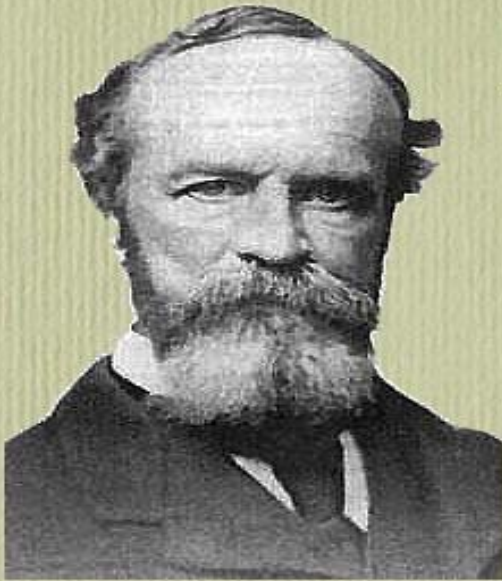
**DSM-5** - Diagnostic and Statistical Manual of Mental Disorder

## *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

James, W. (1890). *The Principles of Psychology*. New York: Henry Holt, Vol. 1, pp. 403-404.

- *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 *distracted*, and *Zerstreuung* in German.*

capture

sélection

conscience

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 :

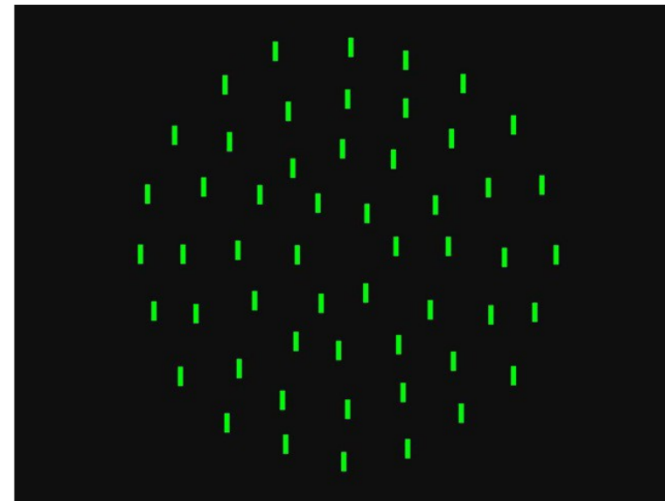
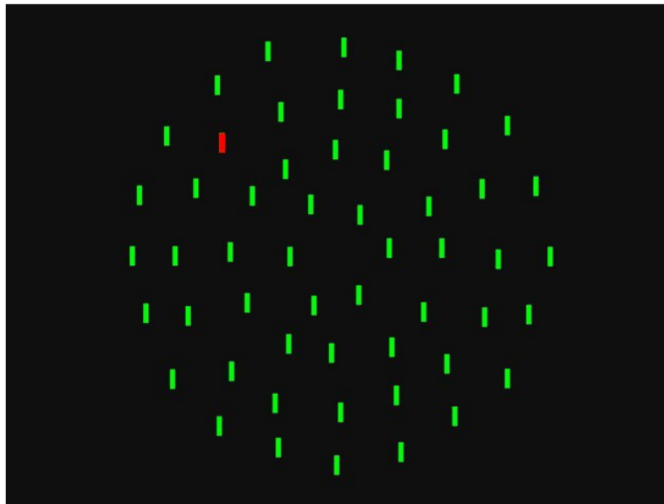
**schizophrenic patients may exhibit difficulties switching between dimensions and between target and absent trials, which we considered implicit rule changes.**

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

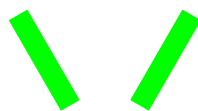
# Popout Task

240 displays:

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



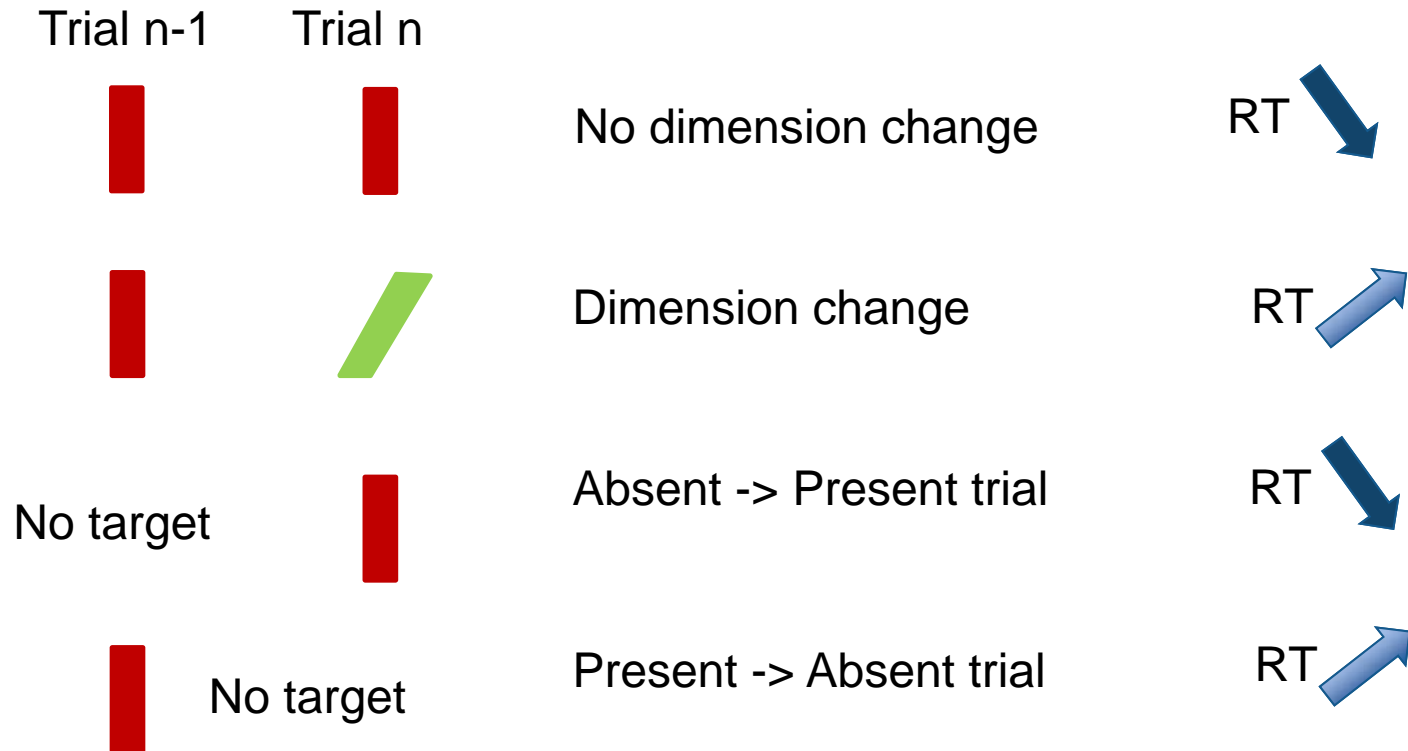
Target :      Color      Orientation



Distractors

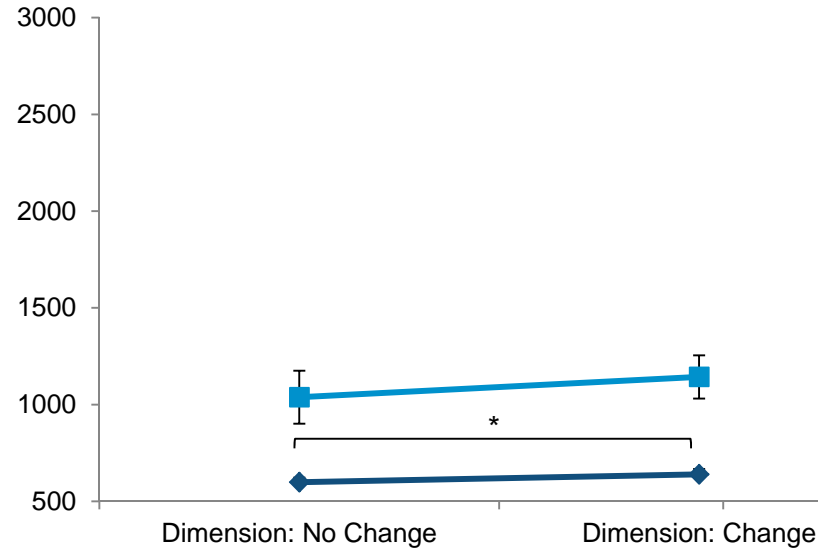


# Intertrial conditions



# Behavioral results

## Manual RT by dimension changes



Control Group

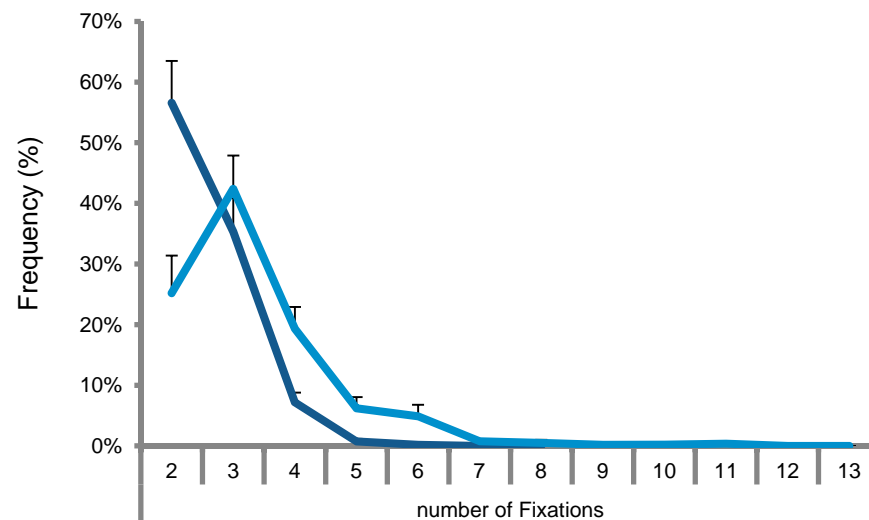
Schizophrenic Group

- RT Schizophrenic Group >> RT control
- RT Absent trial >> RT present trials (Both groups)
- 40 ms intertrial gain found in the control group

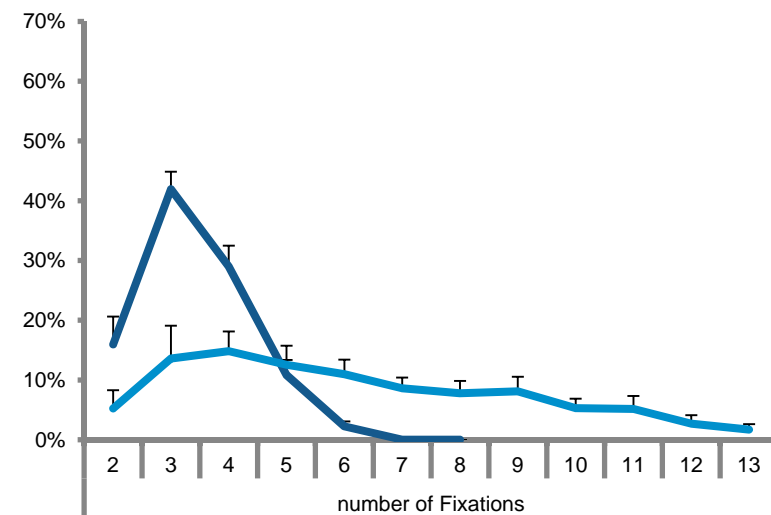


# Eye Movements

Absent -> **Present** trial



Present -> **Absent** trial

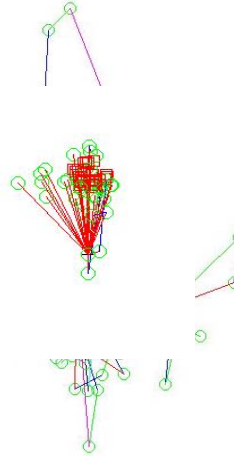


- The number of fixations is significantly larger in the schizophrenic group, with the persistence of numerous fixations when it is an absent trial.

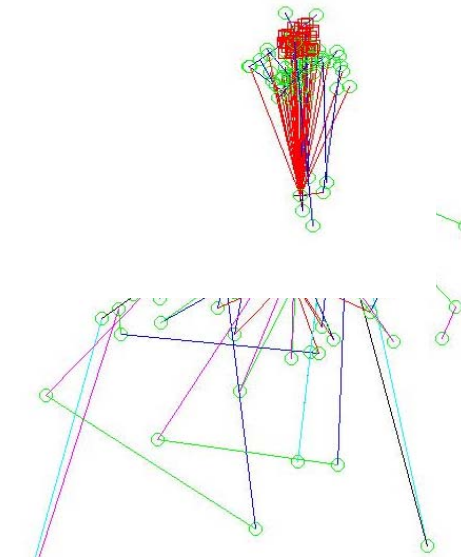
Control Group      Schizophrenic Group

# Gaze Pattern toward the target by target circle positions

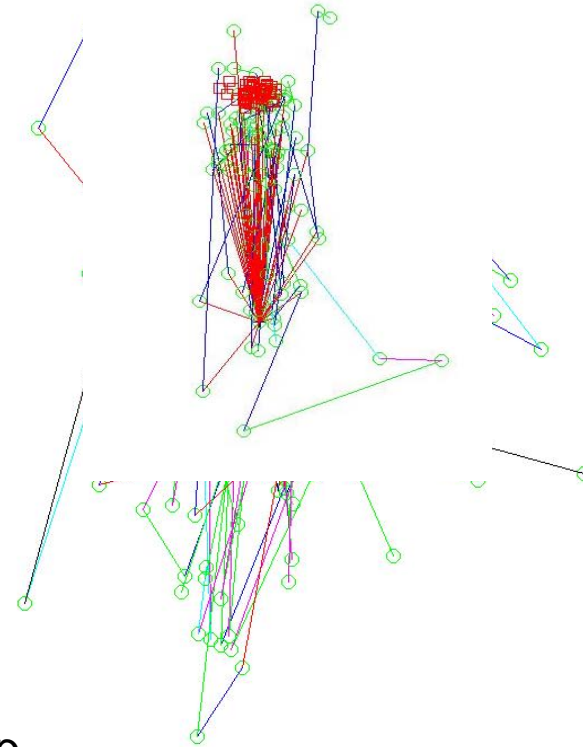
Circle 1



Circle 2



Circle 3



Schöpfung 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 !!**

