

# Cognitieve versus emotionele apathie: verschillende hersenstoornissen?

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Ivan Goncharov, 1858

## Oblomov: inactivity, inertia, apathy

Ten Days With Oblomov: A Journey in My Bed



By GARY SHTEYNGART

## Apathy

- Apathy concerns a quantitative reduction of voluntary, goal-directed behaviors that impairs daily functioning.
- Apathy or lack of will (also termed avolition or abulia) refers to markedly reduced levels of interest in daily activities and a lack of initiative. It may present as indifference.

## Apathy

- common in schizophrenia patients
- Understanding apathy is important, as apathy is the strongest predictor of poor functioning, unemployment, severity of illness and worse outcome in routine clinical practice
- Schizophrenia is a severe psychiatric disorder, 1% of the population.
- incurs the highest costs of any psychiatric disorder in terms of treatment (400 million euro/yr in the Netherlands), not to mention other societal costs (e.g. due to occupational dysfunction). Total estimated costs £6.7 billion in the UK for 2004/05.


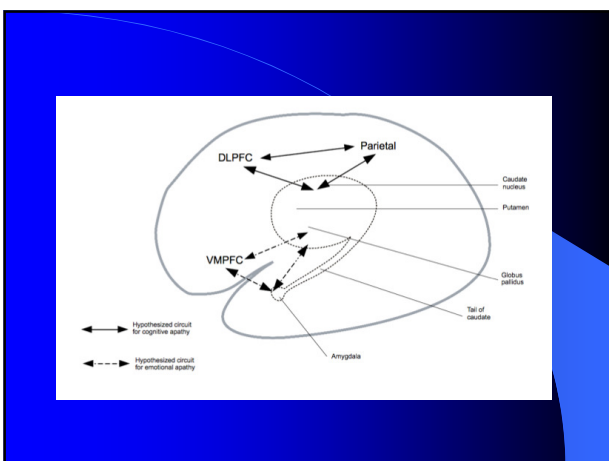
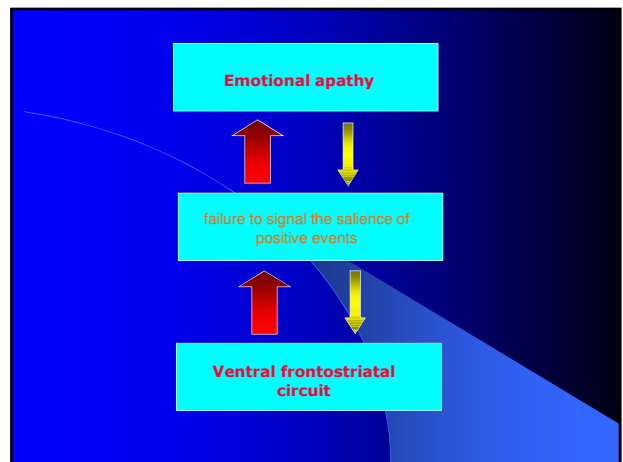
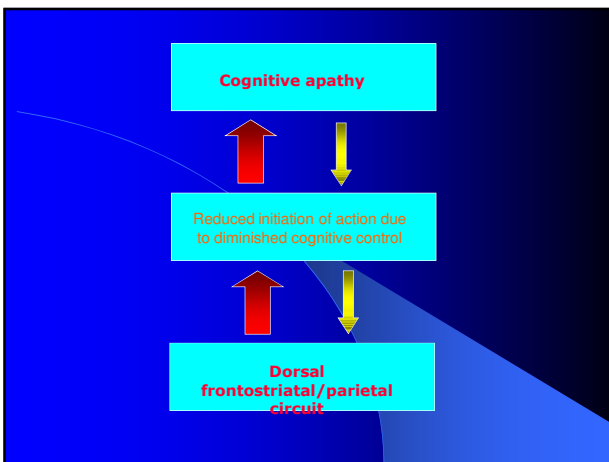
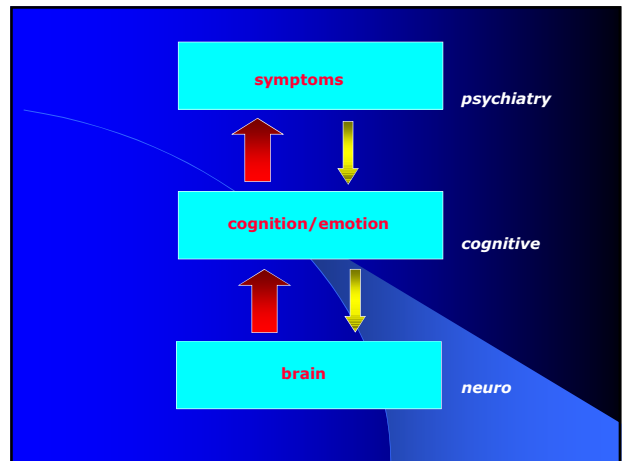
- Cognitive and neural basis of apathy
  - two different brain networks
  - Cognitive apathy: reduced initiative, difficulty starting goal-directed behavior
  - Emotional apathy: reduced interest, lack of anticipated pleasure/contentment

- Test the hypothesis that CA is associated with poorer long-term functioning and neurocognitive deficits
- Test a novel approach for treatment, based on the hypothesized neural circuit


### Cognitive neuropsychiatry

- A theory-driven approach that attempts to explain psychiatric symptoms in terms of cognitive brain processes
- Connects clinical psychiatry with cognitive psychology and the neurosciences

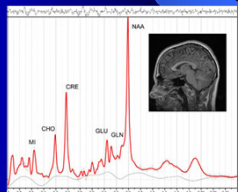
Halligan & David (2001) *Nature Reviews Neuroscience*

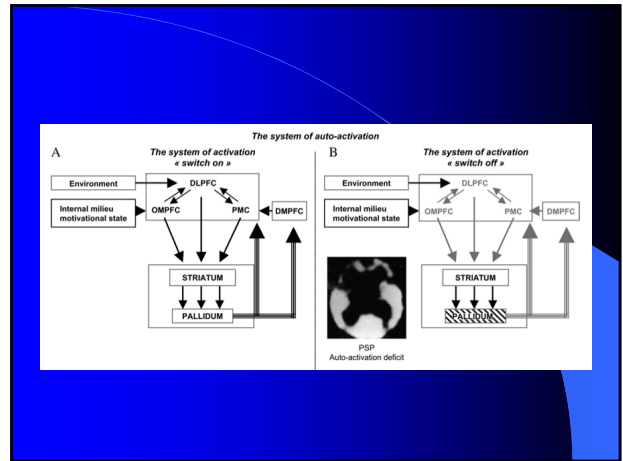
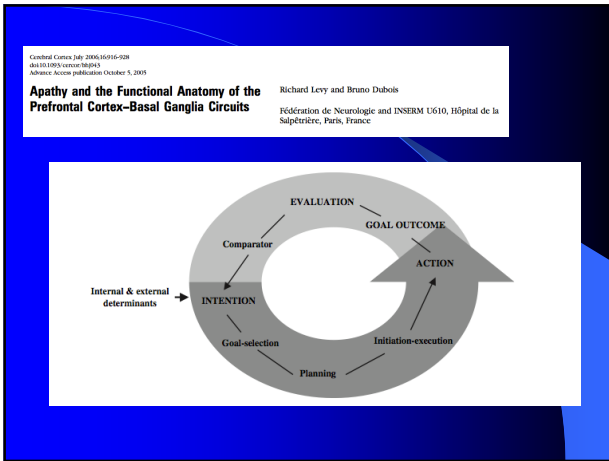
### Dopamine and glutamate



Dopamine binding with positron emission tomography (PET): *social-emotional apathy*



Glutamate concentration with magnetic resonance spectroscopy (MRS): *cognitive apathy*



**fMRI tasks**

- Schizophrenia patients with CA
- Schizophrenia patients with SEA
- Matched healthy control subjects

CA: cognitive control, self-initiated realization of intentions  
SEA: reward, affective forecasting, emotional expectations of future events

**preliminary findings**

Healthy controls, N=14  
Schiz pts, low apathy, N=14  
Schiz pts, high apathy, N=13

**new treatment: transcranial magnetic stimulation (TMS)**

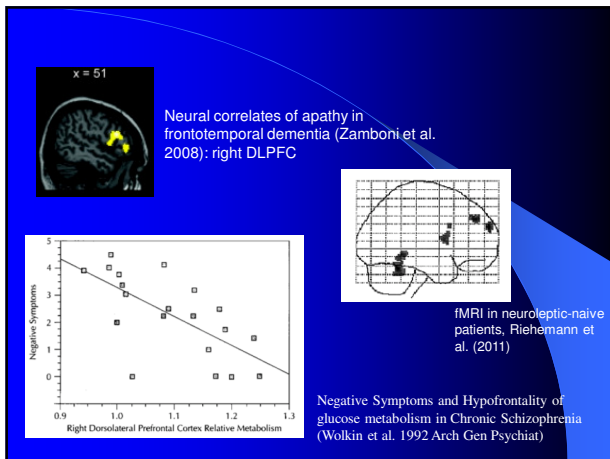
**Repetitive Transcranial Magnetic Stimulation for Negative Symptoms of Schizophrenia: Review and Meta-Analysis**  
Jozarni J. Dłabač-de Lange, MD; Rikus Knegttering, MD, PhD; and André Aleman, PhD

Figure 1. Meta-Analysis of Randomized Trials of Repetitive Transcranial Magnetic Stimulation for Negative Symptoms of Schizophrenia

| Study or Subgroup                     | Standardized Mean Difference | SE   | Weight, % | Standardized Mean Difference, 95% CI | Standardized Mean Difference, 95% CI |
|---------------------------------------|------------------------------|------|-----------|--------------------------------------|--------------------------------------|
| Fitzgerald et al <sup>10</sup>        | 0.54                         | 0.46 | 9.8       | 0.54 (-0.35 to 1.44)                 |                                      |
| Goyal et al <sup>11</sup>             | 2.22                         | 0.81 | 4.5       | 2.22 (0.63 to 3.81)                  |                                      |
| Hajak et al <sup>12</sup>             | 1.05                         | 0.48 | 9.3       | 1.05 (0.11 to 1.99)                  |                                      |
| Holl et al <sup>13</sup>              | -0.47                        | 0.43 | 10.5      | -0.47 (-1.31 to 0.37)                |                                      |
| Klein et al <sup>14</sup>             | 0.1                          | 0.36 | 12.5      | 0.10 (-0.61 to 0.81)                 |                                      |
| Mogg et al <sup>15</sup>              | 0.22                         | 0.49 | 9.1       | 0.22 (-0.74 to 1.18)                 |                                      |
| Novick et al <sup>16</sup>            | -0.29                        | 0.5  | 8.9       | -0.29 (-1.27 to 0.69)                |                                      |
| Prikrýl et al <sup>17</sup>           | 1.1                          | 0.44 | 10.3      | 1.10 (0.24 to 1.96)                  |                                      |
| Schneider et al <sup>18</sup> (1 Hz)  | 0.28                         | 0.35 | 12.8      | 0.28 (-0.41 to 0.97)                 |                                      |
| Schneider et al <sup>18</sup> (10 Hz) | 0.58                         | 0.37 | 12.2      | 0.58 (-0.15 to 1.31)                 |                                      |
| Total (95% CI) <sup>19</sup>          |                              |      | 100.0     | 0.43 (0.05 to 0.80)                  |                                      |

Heterogeneity:  $\tau^2 = 0.17$ ;  $\chi^2 = 16.69$ ,  $P = .05$ ;  $I^2 = 46\%$   
Test for overall effect:  $Z = 7.73$ ,  $P = .03$

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### Treatment of social-emotional apathy?

- Behavioral activation therapy (BAT)
  - 40 patients in active group (2 months)
  - 40 patients in control group (cogn training and "small talk")
- Effective in depression, activates reward systems of the brain (Dichter et al. 2008 *Biol Psychiat.*)

### Summary and conclusions

- There is preliminary evidence supporting the distinction of two meaningful subtypes of apathy: emotional versus cognitive
- Distinct neural circuits, that involve different parts of the frontostriatal system, are involved
- A targeted novel brain-based intervention can be developed inspired by neuroimaging studies: transcranial magnetic stimulation of prefrontal cortex
- The distinction may not only be relevant for schizophrenia, but also for several other disorders (e.g., depression, Alzheimer's disease, Parkinson's disease)

### Dank voor uw aandacht!