SOCIAL COGNITION AND THEORY OF MIND: THE CONTRIBUTION OF THE FRONTAL LOBE

Stefano F. Cappa
University Institute of Advanced Studies and Mondino Foundation
Pavia, Italy
stefano.cappa@iusspavia.it
Disclosure

• None
Learning objectives

- The learner will be able to:
  - Understand the multiple facets of normal social cognition and its impairment in disorders affecting the frontal lobe
  - Select and apply social cognition tests in clinical neurology
  - Diagnose social cognition impairments in cognitive and behavioural neurology practice
Key message

• Social cognition is a central, multi-faceted aspect of human behavior
• Multiple frontal regions are involved in social cognition networks
• A social cognition impairment is often associated with behavioural disorders in neurology, and can be diagnosed with neuropsychological tests
Behavioural and/or cognitive syndrome of the frontal lobe

• Personality changes
• Modifications of social behaviour
• Reasoning and planning disorders
• Working memory impairment
• Attentional deficits
Components of social behaviour

- Self-concept and agentivity
- Theory of mind and empathy
- Sensibility to reward and punishment
- Exploitation-exploration balance
- Propensity for cooperation
Social cognition tests

- Interpersonal Reactivity Index (IRI)
- Revised Self Monitoring Scale (RSMS)
- Social Norms Evaluation
- Emotional faces recognition
- Theory of Mind and Empathy test
- Ultimatum/dictator game
- ...
Sensitivity of revised diagnostic criteria for the behavioural variant of frontotemporal dementia

Clinical criteria for possible Bv-FTD

- Early disinhibition
- Early apathy or inertia
- Early loss of sympathy or empathy
- Early perseverative, stereotyped, compulsive/ritualistic behavior
- Hyperorality and dietary changes
- Executive deficits with relative sparing of memory and visuospatial function
Three central aspects

• Change
• Progression
• Social conduct
Challenges

• Can the traditional description of behavioural disorders be translated into the lexicon of social neuroscience and assessed using objective measures?
• Can the study of neurological changes in early bv-FTD provide useful insights into the neural basis of social cognition?
Disorders of social cognition

Selective impairment of processing of information requiring the attribution of mental states (cognitions, feelings) to co-specifics, and/or of subsequent decision making
Emotion recognition
20 pts, 117 ctrls

* bvFTD < r HC; ** bvFTD < r HC e AD

Dodich et al., 2014
Emotion recognition - Error pattern analysis

Confusion Matrix

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In bvFTD:
- Defective performance in Ekman global score and single emotions recognition (blue cells)
- Higher confusion among negative emotions compared to HC (+)
- Confusion consistently involving anger (+)
- Compared to HC, fear less frequently reported as surprise (asymmetric error pattern between fear and surprise)
Attributing intentions and affective states
Intention attribution

Emotion attribution

dlPFC, dmPFC

vmPFC, Amy, Acc, OFC

Precuneus
Temporo parietal Junction
pSTS

Poletti, 2012
SET-EA
18 pts, 36 ctrls
The ultimatum game

Francesca 5€, Tu 5€
ACCEPT  REFUSE

Chiara 7€, Tu 3€
REFUSE

Daniela 8€, Tu 2€
REFUSE
16 pts, 32 ctrls
Whole-brain analysis

ROI-based analysis
References