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a Carattere Scientifico | IRCCS

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

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Disclosure

- None

Leaning 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

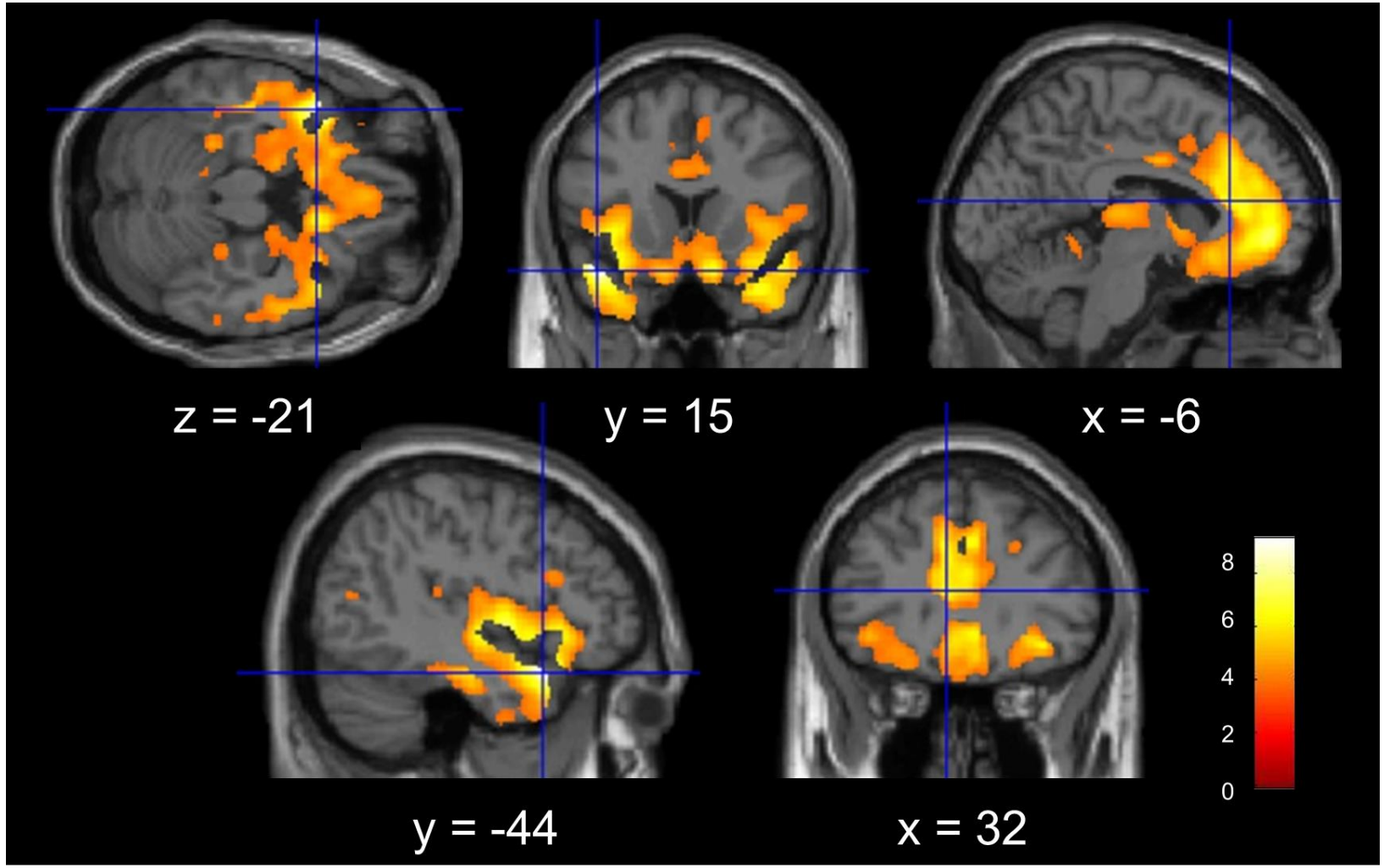
Key message

- 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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y = 15
x = -6
y = -44
x = 32
8
6
4
2
0

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
- …

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BRAIN
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Sensitivity of revised diagnostic criteria for the behavioural variant of frontotemporal dementia

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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

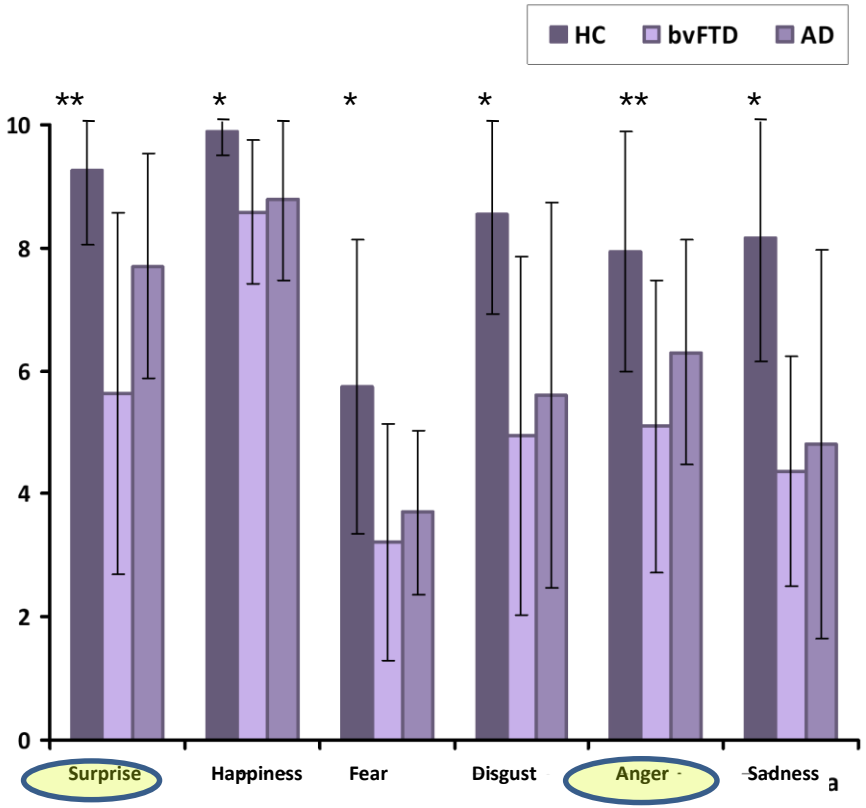
- Can the traditional description of behavioural disorders be translated into the lexicon of social neuroscience and assessed using objective measures?
- Can the study of neurological changes in early bv-FTD provide useful insights into the neural basis of social cognition?

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

26 bvFTD, 52 HC

Confusion Matrix

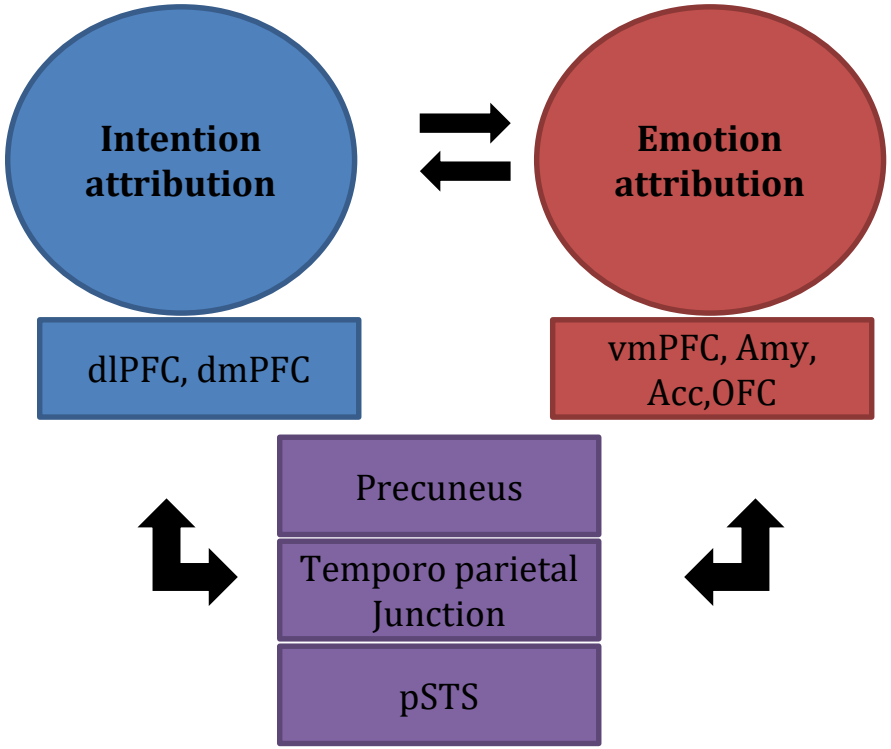
	RESPONSE													
	SURP		**H**		**F**		**A**		**SAD**		**D**		**Missed**	
STIMULUS	BV	HC	BV	HC	BV	HC	BV	HC	BV	HC	BV	HC	BV	HC
SURP	**50**	**91**	6	0.6	19	7.1	6.5	0.1	9	0.4	10	0.9	0.4	0
H	8.5	1.2	**82**	**98.2**	1.5	0	1.1	0	3.5	0.5	2.3	0	1.1	0
F	2.2	31.2	0.8	0.1	**29**	**53.6**	20	7.2	14	2.7	13	5	1.5	0.1
A	11	8	2	0	12	3.6	**43**	**80.1**	11.5	1.2	20.4	7	0.8	0.3
SAD	18	7.5	2	0.4	16	4.4	9.2	2	**42**	**79.2**	11	6.5	1.5	0
D	4	1	3	0	9.2	0.7	21.5	11.3	12	1.3	**48.5**	**85.4**	2.3	0

	RESPONSE					
STIMULUS	**SURP**	**H**	**F**	**SAD**	**A**	**D**
SURP			-		+	
H						
F	-			+	+	
SAD					+	
A				+		
D			+		+	

In bvFTD:

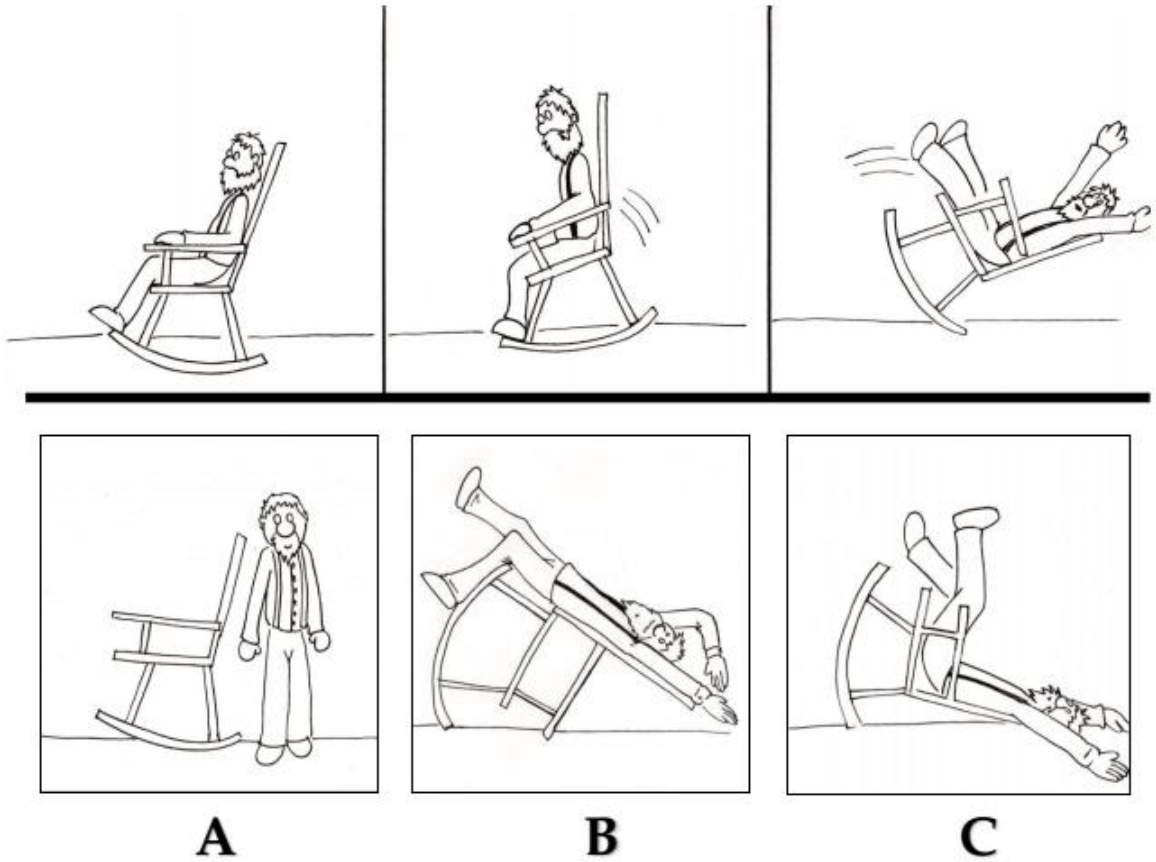
- Defective performance in Ekman global score and single emotions recognition (blue cells)
- Higher confusion among negative emotions compared to HC **(+)**
- Confusion consistently involving anger **(+)**
- Compared to HC, fear less frequently reported as surprise (asymmetric error pattern between fear and surprise)

Attributing intentions and affective states

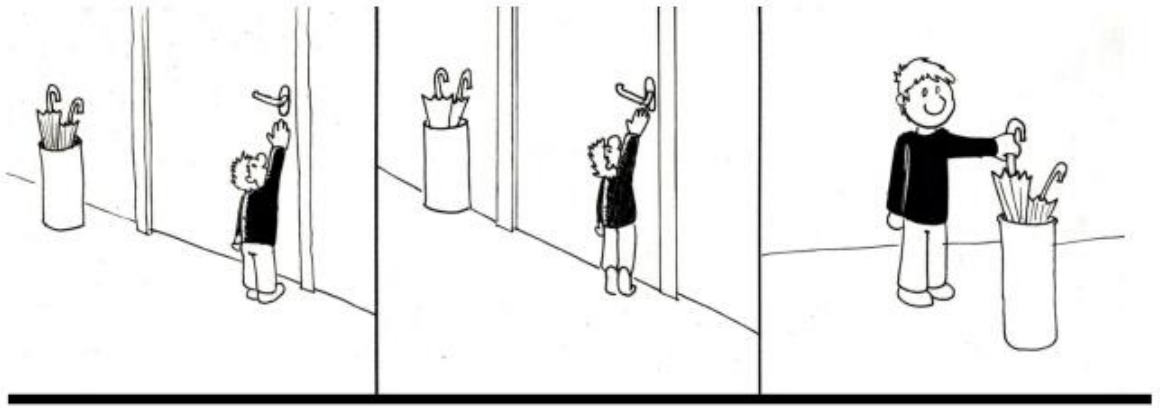


Poletti, 2012

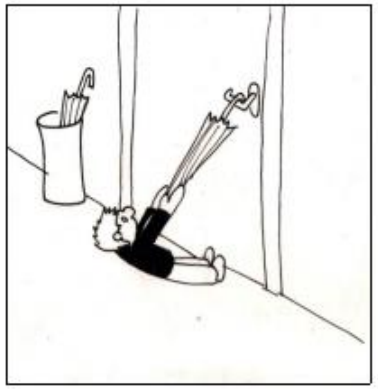
SET-CI



SET-IA



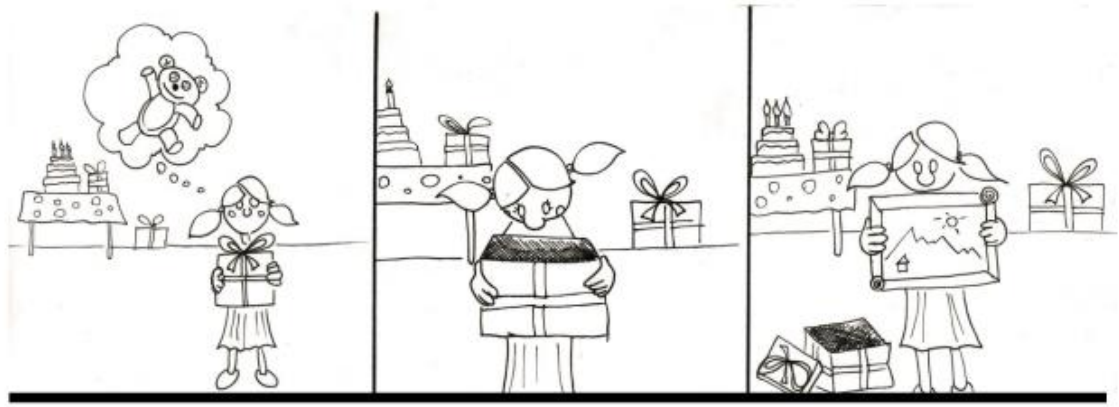
A



B

C

SET-EA

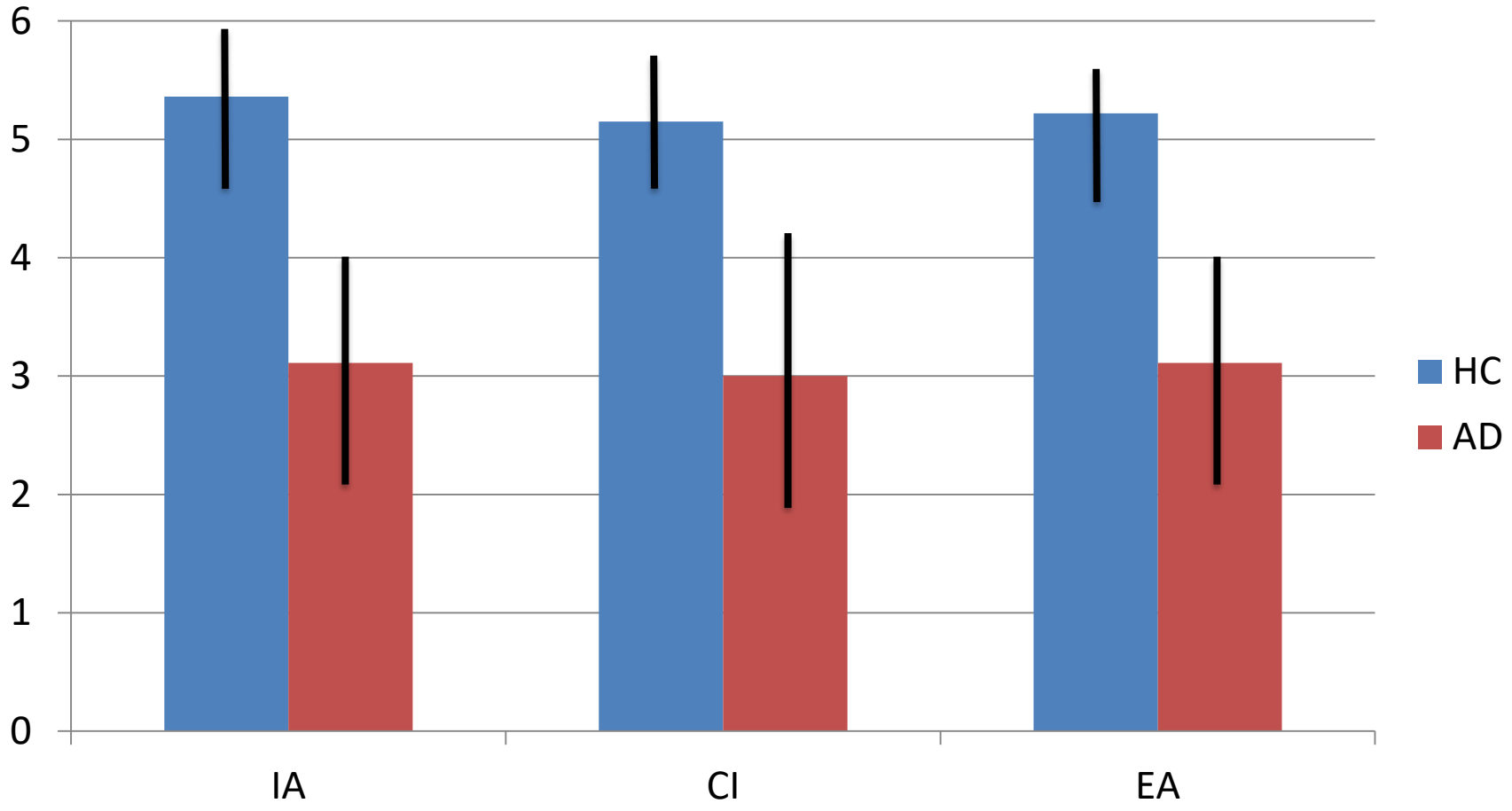


A

B

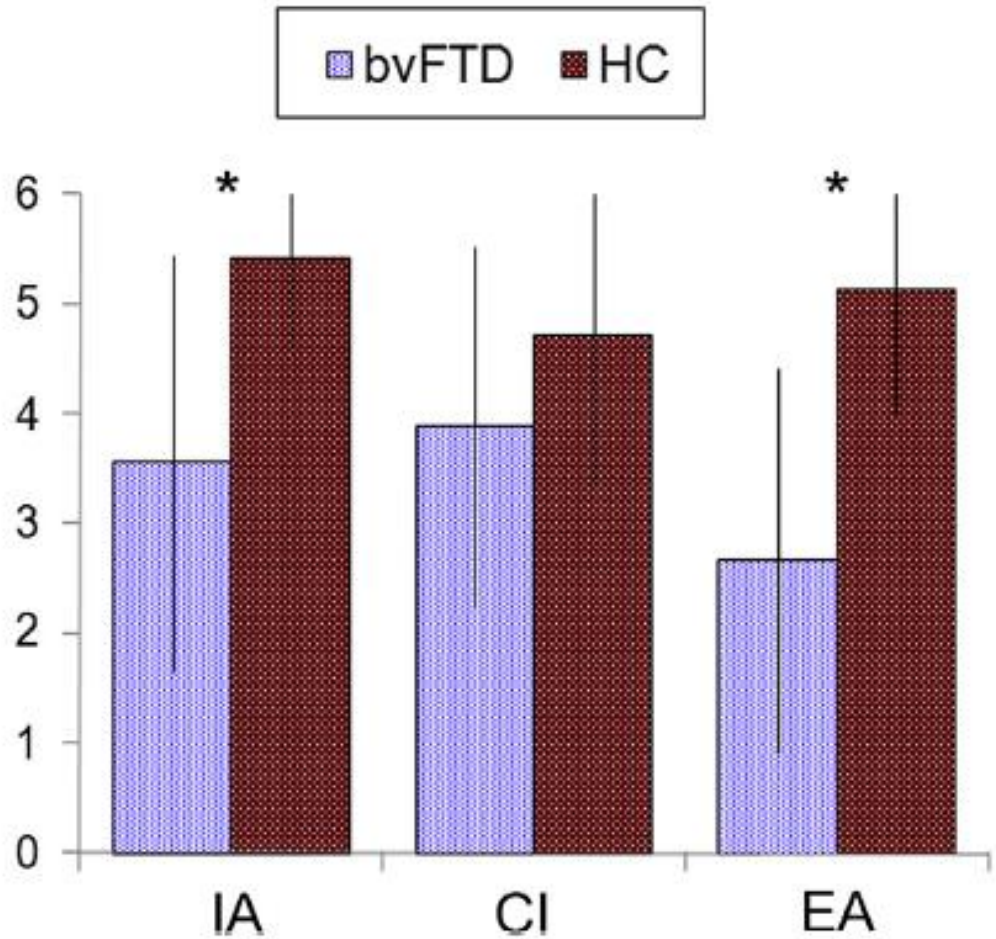
C

AD patients

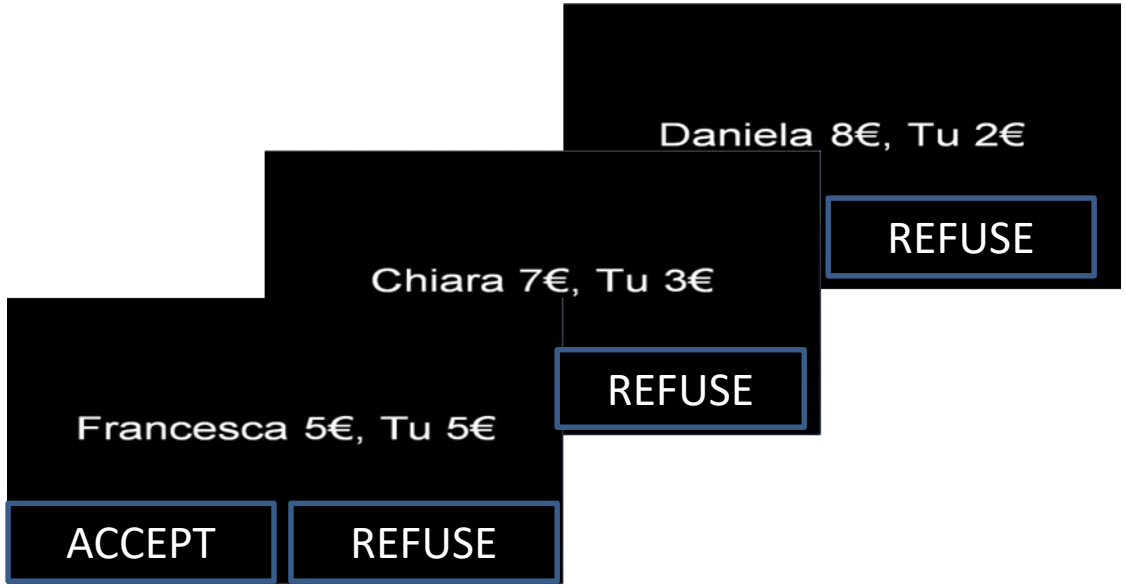


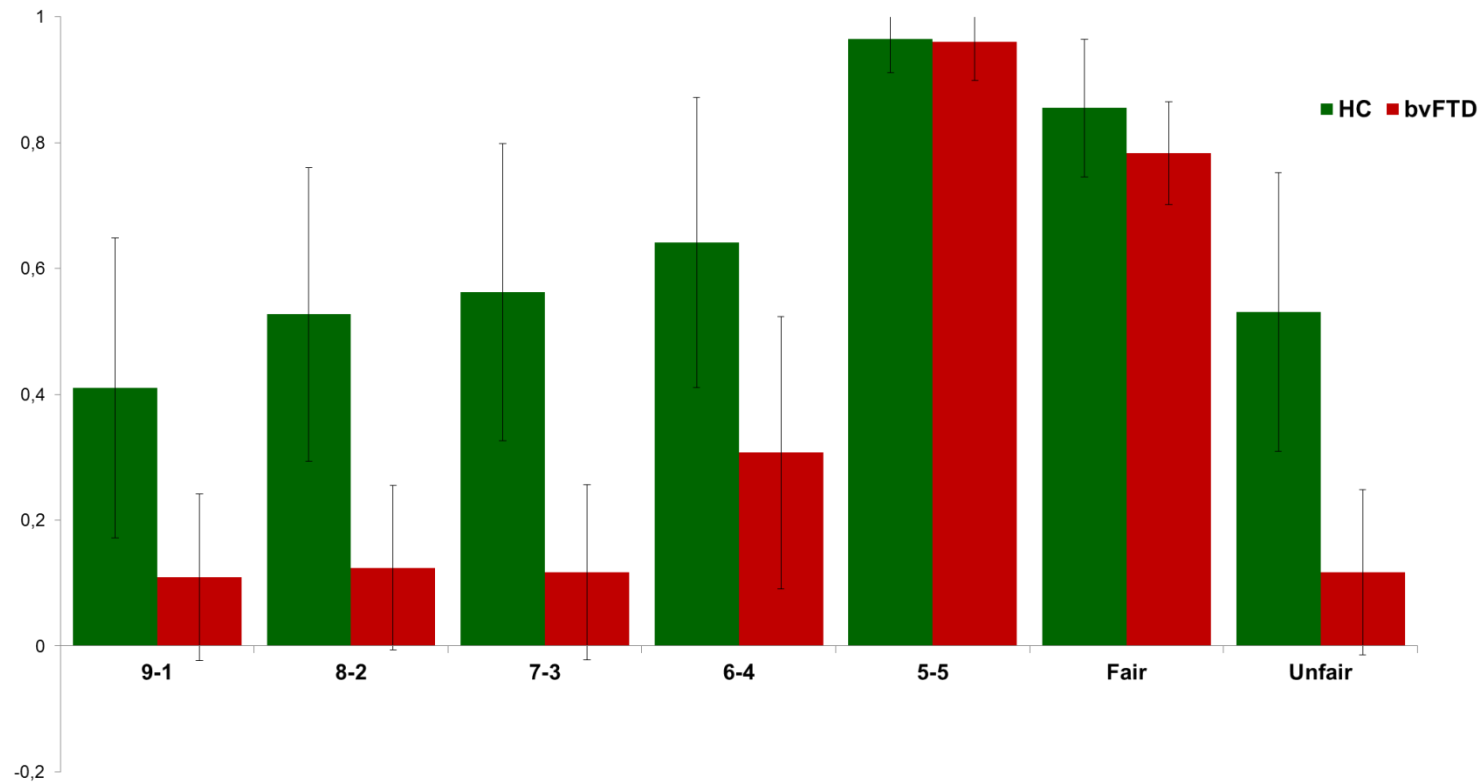
10 pts, 20 ctrls

18 pts, 36 ctrls



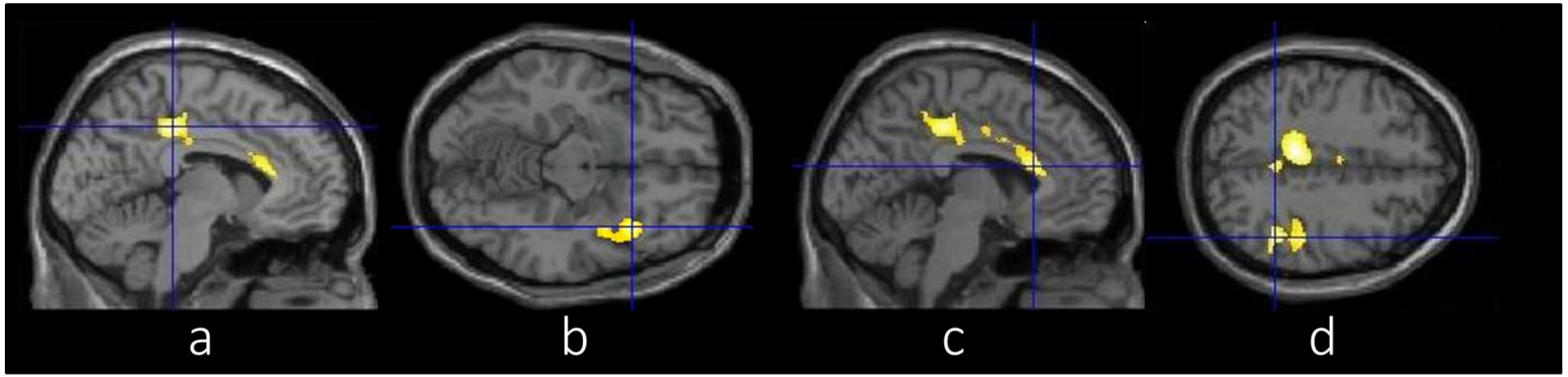
The ultimatum game



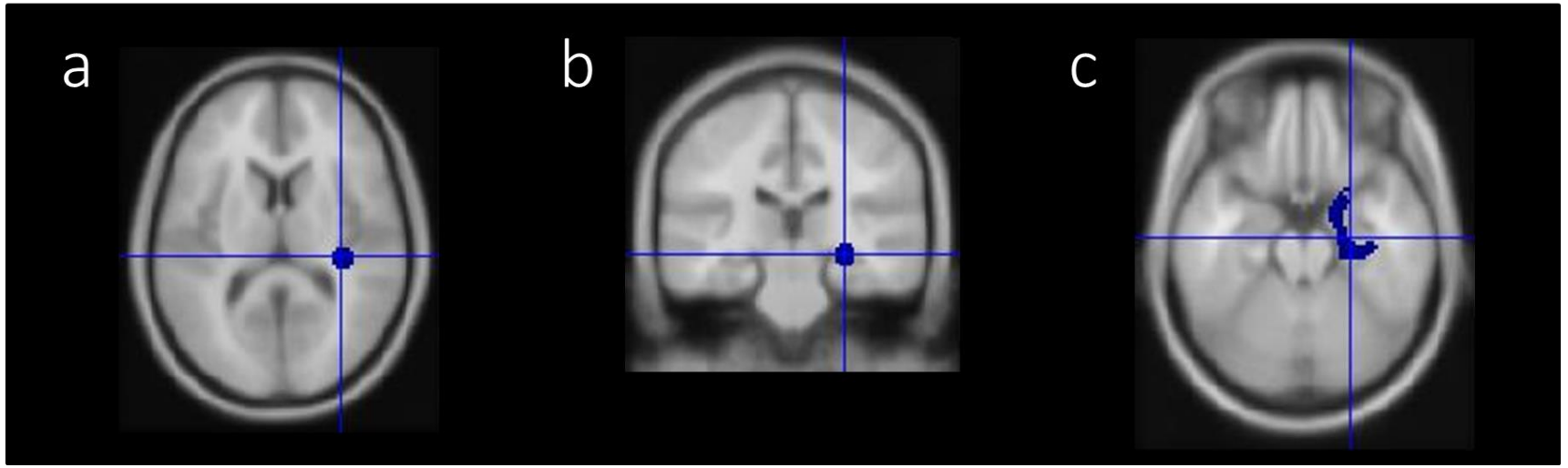


16 pts, 32 ctrls

Whole-brain analysis



ROI-based analysis



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