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MEASURING METACOGNITION

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METACOGNITION

A person's general capacity to think about thinking, both their own thinking and the thinking of others or to forming of cognitions about cognition and affects

- Metacognition
- Theory of Mind (For example defined: "capacity to represent one's own and other persons' mental states")
- Mentalising
- Mindreading
- Social Cognition
- Social Understanding
- Psychological Mindedness

Often used interchangeably

Refers to a general aptitude

Involves a wide range of semi independent faculties

which allow persons to

- represent their own mental states
- represent the mental states of others
- form, revise and reform ideas of what is believed, felt, dreamt of, feared, feigned or pretended.
- interpret others' actions
- understand the causes for our thougths and action… etc…

METACOGNITION IS USEFUL

Allows humans to

- understand one another's intentions
- make meaning of their dilemmas
- adapt to living together in social groups
- adapt to a changing environment.
- solve relational or affective problems
- change a course of action
- satisfying needs
- regulate emotions

FACETS OF METACOGNITION

- Understanding what we ourselves and others think involves complex operations.
- Comprehend internal signals telling us whether we are tired, tense or energetic
- Infer the motivations driving others' actions and effectively pursue profitable goals on the basis of this information.
- Decoding facial expressions
- Consider background information to understand whether for example others are sincere or lying, what has motivated them to behave in the way they have etc.

Grouping these phenomenon together allow to discuss them as a class

- data suggest metacognition involve a number of related but distinct capacities
- operate or are impaired independently of one another
- may require a number of distinct cognitive processes
- People may have more difficulties for instance with one than the other ability, and the brain regions activated by one task do not completely overlap with those activated by the other

DEPENDENCE/INDEPENDENCE

BRAIN IMAGING

Evidence that thinking about thinking is a semi distinct process come from imaging studies.

COMMON AREAS

Areas are activated when individuals mentalise both about themselves and about others:

- medial prefrontal cortex (mPFC)
- medial precuneus (Mitchell, et al., 2005; Moriguchi et al., 2006; Saxe et al., 2006) etc…

Typically activated during self-referential thougth processes:

- ventral medial prefrontal cortex (mPFC) (Gusnard et al., 2001; Kelley et al., 2002; Macrae et al., 2004; Vogeley et al., 2004
- bilateral temporo-parietal junction (TPJ) (Saxe et al., 2006)

The same area of mPFC is activated when mentalising on others perceived as **similar** to the self.

SPECIALISED AREAS

Other areas are instead specialized for mentalizing only in the first ***or*** in the third person.

Subjects had to judge whether a trait adjective applied to them (Macrae et al., 2004; Schmitz et al., 2004; Ochsner et al., 2006).

HIGHER response in

medial regions of the TPJ

but **not** in

lateral TPJ regions

when mentalizing about others perceived as **dissimilar** to the self a more dorsal subregion of the mPFC is activated, an area not engaged in self-reflection. (Mitchell et al., 2006)

FUNCTIONAL DEPENDENCE AMONG THE DIFFERENT ASPECTS…

KNOW YOURSELF…

AND YOU SHALL KNOW THE OTHER

"Then the wise or temperate man, and he only, will know himself, and be able to examine what he knows or does not know, and to see what others know and think that they know and do really know; and what they do not know, and fancy that they know, when they do not. No other person will be

From: “Harry Potter and the deathly hallows”

SIMULATION/PROJECTION

Self as a model of the other' mind

Are the different mechanisms synergic, do they function in succession, with one element using as an input the output of a preceding mechanism, or in certain cases does one impede each other?

Knowing oneself can be the platform from which we understand others (Gallese & Goldman, 1998).

It makes intuitive sense that we use our knowledge of our own current mental state as a basis for making attributions about others.

Persons experiencing sadness are more likely to perceive sadness in ambiguous facial expressions than participants who are not feeling sad (Kawada et al., 2004; Niedenthal et al., 2000; 2001).

Simulation Theory

In many situations people use knowledge of themselves to understand others.

When we see someone else act or feel we unconsciously simulate their actions

Our minds replay how the others acted and felt. According to ST persons use their own mental mechanisms to perceive, calculate and predict others' mental processes (Gallese & Goldman, 1998; Goldman & Gallese, 2000; Gallese, 2001).

ST has been supported by the discovery of what have been called

Mirror neurons.

activated both when individuals carry out actions with a specific object in mind and when they see another individual carrying out that same action. (Gallese, 2001; Rizzolatti, et al., 2002).

The observer deduces the implicit goals of others' actions by their overt behavior.

- reading and understanding of aspects of others' minds
- disgust (Wicker et al., 2003)
- the affect linked to pain (Singer et al., 2004)
- communication and language (Gallese & Lakoff, 2005; Kawato, 1997; Wolpert, Ghahramani & Jordan, 1995).
- understand the intentions driving others' actions (Iacoboni et al., 2005).

Silent speech activates mirror neural patterns with a communicative function, mostly localized in the premotor sector of Broca's area (Ferrari et al., 2003).

Projection Theory

People attribute contents of their own experience to others.

Individuals rapidly and unconsciously perceive feelings, thoughts, goals and inclinations, correlated to their own, in others.

The experience of some moods (happiness, sadness) or motivational states can lead to a tendency to perceive similar moods and motivational states in others (Kawada et al., 2004; Niedenthal et al., 2000; 2001).

People are likely to use their subjective experience of how easy or difficult a given performance task is to solve when it comes to estimating how difficult this would be for other people to perform that task (Kelley & Jacoby, 1996)

Engaging in particular behavior can activate and increase the accessibility of the relevant trait construct in memory, thereby causing perceptions of another person to be more in line with the behavior-relevant trait (Chartrand, Kawada & Bargh, 2002).

Van Boven and Loewenstein (2003): told their research participants about a group of lost hikers deprived of water. Participants who engaged in vigorous exercise (and were thirsty): particularly inclined to estimate that the hikers would be thirsty (as opposed to hungry)

HOW CAREFUL IS MINDREADING BASED ON OWN'S MIND?

Individuals construct models of others' minds automatically and unconsciously, without the inferential reasoning required by a fully fledged understanding of another's thoughts, feelings and intentions. Research has also shown to a certain degree that they are quite precise when constructing these models: for example, observers' mirror neurons may fire when targets significantly resemble themselves.

What research does ***not*** claim is, on the one hand, is how accurate this model of the other is and to what degree the explicit self-knowledge that individuals have influences mindreading.

The majority of research analyzes how individuals use the self as a model in the absence of well-developed reflective knowledge, by, on the contrary, attributing their own contents automatically and unconsciously.

It is possible that, as self-reflective awareness and, thus, the level of detail in which the map of their mind gets self-represented grow, individuals become better mindreaders

In any case, automatic mindreading processes based on simulation are valid tools for understanding others' minds

Observers use **projection/simulation** processes when a target is construed as being similar to them

Target perceived dissimilar: **stereotype**

If another is perceived as a member of social outgroup, one may not apply a nuanced theory of mind to understand the motivations underlying the other's behavior or expressions or imagine chains of causes and effects or make complex inferences.

One instead use less sophisticated mental state attribution strategies, of which the most well-known is the use of stereotypes (Kunda et al., 2002, Kunda & Spencer, 2003).

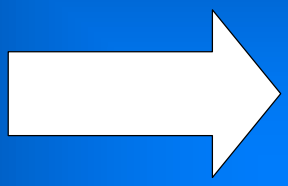
STEREOTYPES

Stereotypes are activated in particular when a self-protective motive is active, and this leads to prejudicial perceptions of certain ethnic groups (DeSteno, Dasgupta, Bartlett, & Cajdrie, 2004; Schaller, Park, & Faulkner, 2003).

White males in a state of fearful activation tend to attribute AGGRESSIVE tendencies and intentions to male Arab or African faces (e.g., Hugenberg & Bodenhausen, 2004; Payne, 2001).

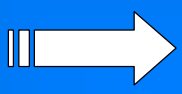
When individuals mentalize about

dissimilar others



describe the latter's behavior as being driven by traits and not by situational contexts (e.g. "he's got angry because he's an angry type" compared to "he's got angry because they haven't given him a raise") or use less mentalistic terminology (Demoulin et al., 2004; Vaes et al., 2003).

Ames (2004): moving a target along the **similarity**/**dissimilarity** access led observers to use projection/stereotyping as alternative strategies.

More **similar**  projection

More **dissimilar**  stereotypes

INDEPENDENCE OF THE FACETS

THE ARGUMENT FROM ERROR

Oversimplified ideas about thinking and knowing are easy to identify in children, whose theories of mind are still immature.

Four-year-olds do not yet have differentiated concepts of 'not knowing' and 'getting it wrong' (Ruffman).

A child and an adult observer ('A') are seated in front of two dishes of beads.

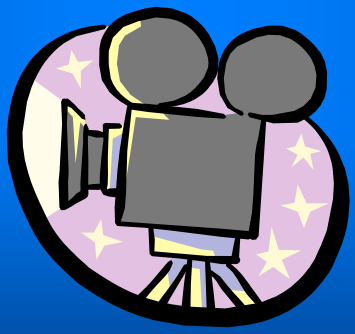
The round dish contains **red** and **green** beads

The square dish contains only **yellow** beads.

Both A and the child watch while a bead from the round dish is moved under cover into an opaque bag.

The child, but not A, knows that the chosen bead was green.

Then the child is asked 'what colour does A think the bead in the bag is?'



AND THE ANSWER IS

The correct answer is that A doesn't know, or (even better) that A thinks it is red or green (but not yellow)

Overwhelmingly, though, the children report that A thinks the bead is

Julia Roberts…

ehm…

red

This answer is not simply random: none of the children said A thinks that the bead is yellow.

The actual result is best explained by an inaccurate generalisation in the child's developing theory of mind: 'ignorance means you get it wrong'.

Because A is ignorant of which bead was chosen from the round dish, A must think that it was the wrong colour, a red one.

SUMMING UP

METACOGNITION

Allows problem solving

Promotes adaption

Many facets that are both

Independent and Related

CLINICALLY RELEVANT!!!

Severe patients feature poor metacognition (as evident with research using related terms).

HYPOTHESES

IN CLINICAL POPULATIONS:

IMPAIRED METACOGNITION

- General and/or

  Selective (only one or some facets are affected)
- Different pathologies – different dysfunctions
- Poor metacognition could be linked to
  - Symptoms
  - Social Adaptation
  - Treatment response
- The various facets could affect each other ("Know yourself…" see former quote from *Harry Potter and the deathly hollows*)

SELECTIVE AND GENERAL DYSFUNCTIONS IN CLINICAL POPULATIONS

GENERAL

- The ability to think about one's own thinking is closely related but not reducible or synonymous with the ability to think about the thinking of another.
- These capacities affect one another.
- Difficulties in one capacity predict difficulties in another.

NON-CLINICAL POPULATIONS

People without psychiatric conditions who have a limited ability to recognize their own thoughts and feelings, sometimes called alexithymia, also have difficulty recognizing, understanding and empathizing with the feelings of other (Bydloswksy et al., 2005; Parker et al., 2005).

Conversely people able to recognize and express their emotions tend to have good mindreading skills.

fMRI study: individuals with greater capacities for self-reflection were more capable of understanding others and less prone to painful emotions than those with Alexithymia, a condition characterized by lesser abilities recognize one's own emotions and their likely causes. (Moriguchi et al., 2006)

PATHOLOGICAL SAMPLES

Asperger

poor ability to understand others' mental states and egocentric (Frith & de Vignemont, 2005) also alexithymic (Hill et al., 2004).

Borderline personality disorder

poor self-reflection (Bach, de Zwan, 1994; Minzenberg, Fisher-Irving, Poole & Vinogradov, 2006; Prunetti et al., in press; Semerari et al., 2005)

impaired recognition of other's affects from facial expressions and vocal clues (Minzenberg, Poole & Vinogradov, 2006).

Schizophrenia

unaware of the thoughts and feelings of others and

less aware of their own mental illnesses (Gambini, Barberi & Scarone, 2004)

SELECTIVE

thinking about oneself and others has to involve some of the same processes, evidence from clinical studies has suggested these two capacities are not redundant.

Schizophrenia

Relatively aware of their own thoughts and feelings were equally as likely as not to be able to view the world as involved the complex thoughts and feelings of others (Lysaker et al., 2007).

In other words it was possible for persons with schizophrenia to possess basic self reflectivity and be unaware of the needs and mental states of others.

Awareness of one's own thoughts and feelings was linked to flexibility in abstract thought while visual memory and processing was more closely linked with awareness of the needs of others.

In two controlled case studies of recovery of metacognitive capacity in schizophrenia, improvements in awareness of one's own thoughts and feelings appeared to take place months before similar improvements in awareness of the world as involving the needs of others (Lysaker et al., 2005; 2007).

PERSONALITY DISORDERS

Patients may have impairments in capacities more close related to awareness of their own minds or those of another (Dimaggio, Semerari, Carcione, Nicolò, Procacci, 2007; Semerari, 1999; Semerari et al., 2003; 2007).

Narcissistic PD may be able to describe their inner world but have difficulty grasping the relational causes of their emotions (Dimaggio, Procacci, Nicolò et al., in press)

Borderline PD may be able to recognise their emotions and their likely causes but cannot distinguish between fantasy and reality in their own thinking (Semerari et al., 2005).

METACOGNITION ASSESSMENT SCALE

Refer to MAS-R printed scale

PSYCHOMETRIC PROPERTIES

Interrater

MAS-R

Agreement was calculated with submission of two sample sessions from two Italian patients to three independent judges, who repeated the scoring about six months later. Initially

Kendall's W= .935 for the first patient and .931 for the second patient.

In the second scoring it was W= .929 and W=.898 respectively ($p < .01$).

METACOGNITION ASSESSMENT SCALE (MAS)

Understanding of one's own mind	*Understanding of others' mind*	*Mastery*
Identification	Identification	Basic Requirements
RelatingVariables	Relating Variables	First-Level Strategies
Differentiation	Differentiation	Second-Level Strategies
Integration	Integration	Third-Level Strategie
	Decentration	

Identification (ID): is the ability to distinguish, recognize and define the inner states (emotions, cognitions, intentions) of oneself and others.

e.g.:

…yeah, it, it's more of um, I understand it but then, you know, the anger and the resentment is still there.

Relating Variables (RV): is the ability to establish relations among the separate components of a mental state and between the components of mental states and behavior

e.g.:

and my mood would change because I… um automatically think he's you know,going to uh, out to gamble or have a game of cards or whatever…and my mood, just, it triggers.

Through RV a subject explains his/her own behavior in terms of causes and/or motivations.

- Emotional component: “I am preoccupied”

- Ideative component: “I am thinking that the report is not clear”.

- The relationship between emotional and ideative components; “I am preoccupied because I am thinking that the report is not clear”

MONITORING FAILURES

P.: “I went to the university” (silence)

T.: “How did you get on?”

P.: “Well,…” (silence)

T.: “How did you feel?”

P.: “My hands were trembling”

The patient describes her somatic state instead of describing her emotional condition.

T.: “It must have been difficult. Do you remember what you were thinking of?”

P.: “I was nervous”

T.: “What did you think of in those moments?

P.: “Nothing, maybe I looked odd”

Differentiation (D): is the ability to recognize the difference between representations and reality. It also allows us to consider our representations of the world and of other individuals as subjective and hypothetical.

•The ability to differentiate permits one to carry out decentration operations. Infact, we need to add that comprehension of other individuals' mental states may take place in a decentered or egocentric way.

The scale therefore includes **Decentration (Dec)**, referring to the ability to comprehend another individual's mental state from a non-egocentric perspective. It enables us to recognize the hypothetical nature of our reading of other individuals' minds and, at the same time, we are able to produce interpretations independent of other people's knowledge of themselves.

e.g.:

She was staring at me; I thought she was in love with me but maybe she was only tired, looking into empty space.

By "understanding of the others' mind" we mean an **ability.** By "decentration" we refer to the **perspective** from which such ability is exerted (self-centred/decentralized). We can say that it is not possible to assume a decentralized perspective without owning a good ability to understand the others' mind.

RELATIONSHIP BETWEEN THE UNDERSTANDING OF OTHERS' MIND AND DECENTRATION

Integration (I) is the ability to work out coherent descriptions of one's mental states and processes. It is the function we use to describe and discuss our inner scenery, a dialogue inside ourselves that takes a narrative form and gives a sense of continuity to the private and interpersonal aspects of our self.

INTEGRATION SUCCESSES

"At that time I felt insecure. I thought I wasn't doing anything right and that everybody would think bad of me for this reason. My embarrassment made me cut myself off from others"

"That's just like me. I start out with great enthusiasm and I'm sure I'm going to manage. Then the effort involved makes me less sure of success. I find the thing falling to pieces before me and I lose interest. At this point I depend wholly on others' giving me their approval if I am to get going again."

INTEGRATION FAILURES –1

In order to define the integration's failures we consider:
The non integration between opposite mental states, according to the Kernberg' definition:

"I remember her as being very welcoming….She made me feel sure of myself. She was always insisting that I needed to try and have more self-confidence".

Then, during the same session, a few minutes later

"I didn't feel she was sincere. There was something about her that didn't convince me. Even the question of having more confidence in myself….Talk about confidence! It was in her that I needed to have more confidence!"

INTEGRATION FAILURES – 2

The non integration between multiple and incompatible representations that are present at the same time within the same mental state:

P: I couldn't manage to get to sleep. I was thinking about plucking up courage and about how I don't manage to. I just wanted to sink into the arms of someone willing to take me. I wanted to wake my parents up and spend a little time with them, or else go to the sitting room. They'd have heard me and called me…I imagined they'd have got angry too for my waking them up, and that they'd have criticised me, and I didn't know how I'd have reacted.
T: You thought they'd have criticised you?
P: Yes, I thought they'd have said, "Even at night you have to be a nuisance" and it annoys me. I get to feel angry because it's not right. I'd like things to go in a certain way and instead I felt guilty because I make them suffer.

INTEGRATION FAILURES – 3

The non integration linked to the over-crowding of thought themes and different emotions without any hierarchy of relevance and expressed without narrative connections that are consistent with the communicative intention:

P: Eleonora asked me to go with her. We went by car. I realise now that I'm not taking either the bus or the underground. Not even together with other people. I thought that I hadn't managed to do this thing and that I won't manage to do anything, and I felt annoyed with my father. I just don't tolerate anything he does or says. I realise I'm not capable of keeping to the subject when I'm speaking…I don't know. I felt very guilty. I've just thought of my mother and of the fact that I don't manage to please her.

Mastery Basic Requirements refer to the ability to define problems in plausible psychological terms and assume an active behaviour toward the solution of them.

- **First level strategies** require only a low reflecting effort. They include modifying a mental state by influencing the organism, avoiding feared situations or resorting to interpersonal assistance.
- **Second level strategies** require a greater reflecting effort. They include, on a voluntary basis, imposing upon oneself or inhibiting a certain type of behaviour, actively modifying one's level of attention and concentration and voluntarily thinking or not thinking about a problem.
- **Third level strategies** They include rational critical attitude to the beliefs that are behind a problematic state, using one's knowledge about others' mental states to regulate interpersonal problems and accepting in a mature way one's personal limits when trying to master oneself or influence events.

MASTERY

The ability to define problems in psychological terms, to cope with them using mentalistic strategies apt at solving them, finding solutions to dilemmas, or managing psychological suffering they create.

“ I was in a bad mood and my partner got annoyed. I understood he was not angry at me, he was in trouble and he simply didn’t know how to help me… I tried to speaking with him about the situation.”.

Abbreviated MAS

Indiana Psychiatric Illness Interview (IPII)

Refer to printed document

METACOGNTION ASSESSMENT SCALE: A BRIEF OVERVIEW AND CODING MANUAL FOR THE ABBREVIATED VERSION

MAS-ADAPTED

Two samples of North-American male schizophrenics (Lysaker et al., 2005).

Interrater reliability for the MAS scores was assessed by two raters blindly rating 25 transcripts.

Intraclass correlation for all four MAS scales ranging from $r = 0.61$ ($p < .05$) for Decentration to $r = 0.93$ ($p < .0001$) for the total score. (Lysaker et al., in press).

Convergent and Divergent

MAS-ADAPTED **correlates**, when applied to persons with schizophrenia

- Scale to Assess Unawareness of Mental Disorder (Amador et al., 1994). Measures the ability to evaluate one's own mental states (Lysaker et al., 2005b).
- impoverished psychosocial function
- deficits in neurocognitive abilities (Lysaker et al., 2005b)
- recently to performance in tests of affect recognition (Lysaker et al., 2007).
- Scale to Assess Narrative Development Measures depth of personal narrative

Divergent: instruments that measure theoretically unrelated concepts

- internalized stigma (Lysaker, Buck, Taylor, & Roe, 2007).
- no-correlations with aspects of executive function (but correlate with other aspects Lysaker et al., in press.

MAS AND EXECUTIVE FUNCTION

Spearman Rho

Understanding one's own mind

linked to better performance on

- Sorting
- Word Context
- Twenty Questions
- Greater cognitive insight on the BCIS.

Relatively unrelated to inhibition switching tests.

Maybe understanding one's own thoughts and feelings is more a matter of moving flexibility between ideas and finding different patterns but not necessarily having to inhibit certain ideas and then move back and forth between them.

Understanding the others' mind

linked to better performance on

- Design Fluency Switching
- Twenty Questions tests

Mastery

linked to better performance

- Verbal Fluency Switching
- Twenty Questions tests.

Decentration

highly skewed range

76% of the sample score of "1" or less

categorical variable

high Decentration > 1

low Decentration < 1

high (n = 7) vs. low (n = 42) Decentration higher scores

- Verbal Fluency
- Color Word switching
- Word Context tests
- No difference on Insight (BCIS)

Metacognition is linked to executive functions in schizophrenia.

MAS scores suggesting greater levels of awareness of their own thoughts and feelings performed better on three tests of mental flexibility.

Supporting the validity of the MAS Understanding one's own mind scale, results indicated it was significantly correlated with the BCIS total score, which assesses the ability to question one's judgments.

As predicted, a theoretically semi-independent metacognitive capacity, decentration (the ability to see the world as involving the independent perspectives of others) was linked with poorer performance on two of three tests of the ability to inhibit a response and then make an alternate one.

Scores on the DKEFS test of the ability to inhibit verbal categories correctly classified 71% of the sample as having high vs. low capacities in the domain of Decentration.

Finally, providing only partial support for the initial hypotheses, lesser awareness of the thoughts and feelings of others and less capacity for coping with distressing psychological states were each linked to one of the three tests of inhibition, the former to a visually-based test and the latter to verbally-based test.

HYPOTHESES: EF AFFECTS METACOGNITION

It is possible that as persons are less able to move flexibly between abstract ideas, they cannot detect or express the nuances and patterns available in daily life experiences.

Without being able to define thoughts and feelings in multiple ways, complex self-awareness may become difficult to sustain.

With a reduced capacity to inhibit one's immediate thoughts or reactions, one's own needs may serve as a barrier to recognizing the needs of others and to silencing one's chances of finding multiple ways of seeing others in relation to oneself.

Perhaps to see the world in a decentered manner people need to be able to detect meaning in rapidly evolving but ambiguous situations.

HYPOTHESIS: METACOGNITION AFFECTS EF

It is possible that a nuanced understanding of the mind of the other promotes inhibition.

For example: Persons might inhibit a wish to ask for a raise at work until after they have surveyed the mood of their supervisor that day.

MAS-R: CONVERGENT

MAS-R correlate with tools measuring theoretically similar constructs, for example

Assimilation of Problematical Experience (Assimilation of Experience Scale, APES, Stiles et al.

When analyzing a depressed patient's psychotherapy, both tools consistently distinguished sessions with good access to inner states and mastery of problems from others with poor insight (Carcione et al., submitted; Stiles et al., in press).

Inter-correlations among metacognition subscales

	Understanding one's own mind	Understanding other's mind	Mastery
Understanding one's own mind	xx		
Understanding other's mind	0,56**	xx	
Mastery	0,59**	0,39**	xx

**P < 0.01.

MAS RESEARCH RESULTS

PERSONALITY DISORDERS (MAS-R)

PILOT STUDY (SEMERARI ET AL., 2003)

1 BPD

1 NPD

Session transcripts.

1-year of cognitive-constructivist psychotherapy (now Metacognitive Interpersonal Therapy see later).

BPD: severe alteration in differentiation integration.

Differentiation: 33 out of 37 sessions failures exceeded successes

Integration : In only 2 sessions more successes than failures.

Monitoring: Good (capable of describing thoughts and emotions and their causes)

Mastery: Impaired – No improvement

NPD

Monitoring: Impaired In particular

Relationship between variables: failures exceeded successes in the first 25 of the 38 sessions.

Partial resolution toward the end of the year:

some sessions successes = failures

other sessions: successes > failures

Differentiation: Good

Integration Minor impairment (prevalence of failures only in sessions 1-12).

Mastery: Impaired – Improves after s. 25

Possible confound:

- Global Severity (NPD higher functioning)?

- Quality of alliance? (not likely: very negative in the NPD, probably positive although not measured in BPD)

BORDERLINE PERSONALITY DISORDER

(Semerari et al., 2005)

4 patients

Session transcripts

First –year of therapy

Same approach (1 patient same than Semerari et al., 2003)

Only Own's mind MAS-subscale

Results consistent with the first study

Monitoring: preserved 3 out of 4

Minor impairment 1 out of 4

Differentiation: impaired 4 out of 4

Integration : impaired 4 out of 4

All the patients: D and I failures exceeded successes in the first part of therapy. 1 patient: inversion in the last third

2 patients second half: swings between periods of three to four sessions with a prevalence of successes and others of a similar length with a prevalence of failures.

1 patient remained impaired

NARCISSISTIC AND AVOIDANT PERSONALITY DISORDERS

(Dimaggio et al., in press)

2 NPD (1 the same than 2003 study)

2 APD

Session transcripts

First –year of therapy

Same therapeutic approach

Only Own's mind MAS-subscale

Monitoring

2 NPD – 1 APD Impaired

1 APD Preserved

IMPAIRED patients

Failures exceeded successes in the first half of the year.

NPD patients: improve in the second half

APD patient (of note: with schizoid traits) remained impaired

DIFFERENTIATION

more **successes** than **failures**

INTEGRATION

1 NPD **good functioning**

This patient thus had an uncoupling symmetrical to that found in the BPD patients: monitoring impaired and differentiation and integration working.

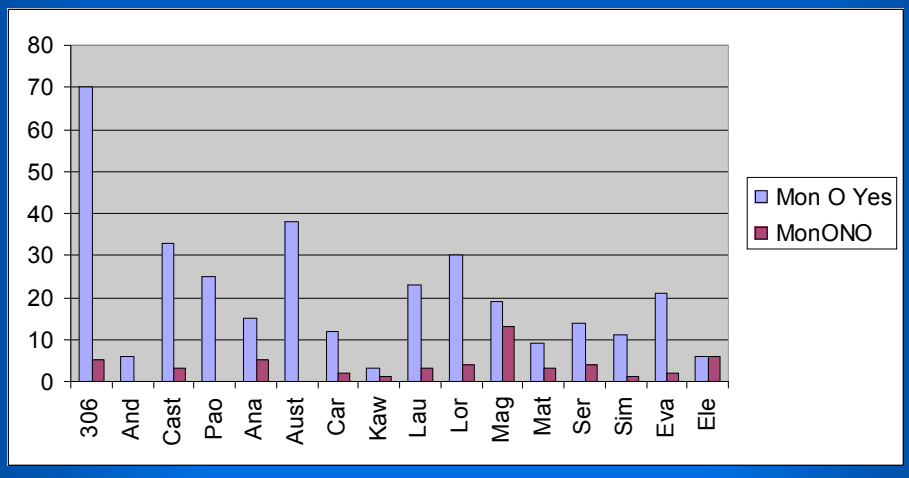
1 NPD **Impaired** in the first half, **improves** in the second half.

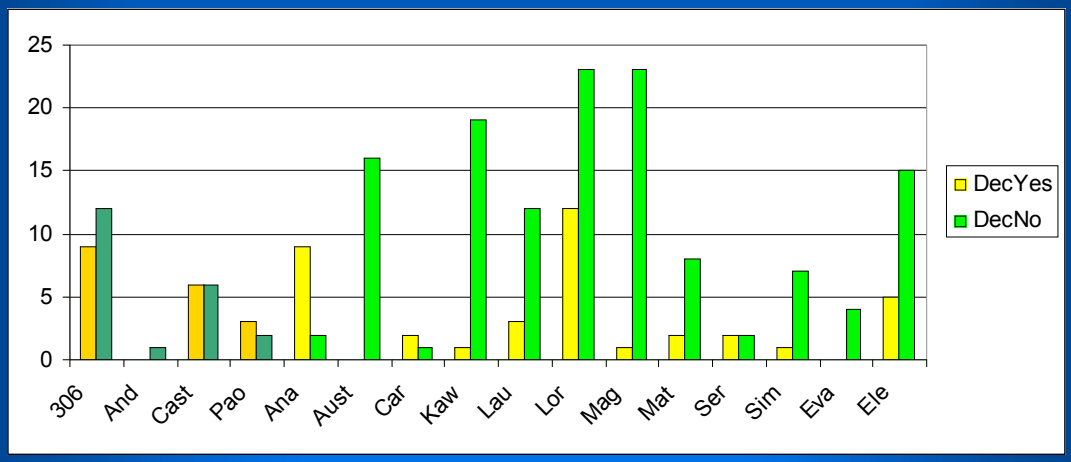
PERSONALITY DISORDERS

UNDERSTANDING OTHER'S MIND AND DECENTRATION

- **13 PDS**
- **3 AXIS 1**
- **13 PDS AND 1 AXIS I SAME APPROACH**
- **1 AXIS 1 PSYCHODYNAMIC**
- **1 AXIS PROCESS-EXPERIENTIAL**
- **first 4 and first 16 sessions**

Pz	DecYes	DecNo	Mon OYes	MonONO
306	9	12	70	5
And	0	1	6	0
Cast	6	6	33	3
Pao	3	2	25	0
Ana	9	2	15	5
Aust	0	16	38	0
Car	2	1	12	2
Kaw	1	19	3	1
Lau	3	12	23	3
Lor	12	23	30	4
Mag	1	23	19	13
Mat	2	8	9	3
Ser	2	2	14	4
Sim	1	7	11	1
Eva	0	4	21	2
Ele	5	15	6	6





ALL PATIENTS

Understanding of others' mind: **Good**

Decentration: **Impaired**

Diffrent from our schizophrenic samples: poor understanding of others' mind

Functions **change** over the therapy course

Sometimes: Improvement

Successes and failures in the same function during the same session.

Metacognitive function state-dependent?

No specific profile for each diagnosis on Axis II and I

UOM and Decentration are similary intact or affected in the different PDs

GENERAL COMMENT

No severe difficulties in monitoring the others' mental state

Some of their relational problems could be referred to the difficulty in making inferences on others' mental state which allow them to understand that the behaviours and the attitudes of the others can be explained by mental processes which are distinct from theirs (**egocentrism**)

It is important to **take on a decentrated perspective** and **not** using one's own interpersonal schemas to interpret the others' mental states.

Needs bigger sample and more sensitive instruments to catch problem in reading the mind of the others

SCHIZOPHRENIA

Narratives of 61 men with schizophrenia

- MAS-ADAPTED
- Symptoms (PANSS)
- Quality of life: QOL
- Neurocognition: Hopkins (HVLT); WCST; Visual Reproduction Sub-test; Digit Symbol Subtest; Vocabulary
- Insight: Scale to assess Unawareness of Mental Illness (SUMD)

- Controlling for age and education, understanding of one's own mind was linked with better neurocognition across multiple domains, and lesser emotional withdrawal.

- Greater understanding of other's mind was linked with better verbal memory and less emotional withdrawal.

- Greater metacognition in the context of purposeful problem solving was associated with better verbal memory, insight and social function, and less emotional withdrawal and paranoia.

Deficits in metacognition within the narratives of persons with schizophrenia are linked with

- **symptoms**
- **quality of life**
- **neurocognition**
- **poorer awareness of illness**

verbal memory

linked to

- Understanding one's own mind
- Understanding of other's mind
- Mastery.

visual memory

processing speed

premorbid intellectual function

linked to

- awareness of one's own mind

Emotional withdrawal

linked to

- All three domains of metacognition.

Depression

linked to

- Understanding one's own mind

quality of life insight

linked

mastery.

deficits in the ability to reflect on one's own thinking within the context of active problem solving may relate to impairments in neurocognition and insight.

it is metacognition with regards to purposeful problem solving which is most closely linked with difficulties accurately conceptualizing one's own illness.

Suspiciousness

linked
Mastery

Hallucinations
linked at the level of a trend to
Understanding one's own mind

The link between understanding one's mind and depressed mood may suggest that with greater awareness of one's own thoughts as objects of reflection comes greater pain.

SECOND STUDY

Classyifying patients according to metacognitive dysfunctions

Lysaker, Dimaggio, Buck, Carcione & Nicolò, 2007

Further divided the subjects into three groups on the basis of their performance on two subscales "Understanding of one's own mind" "Decentration"

3 groups:

- impaired self-reflectivity/poor mindreading
- intact basic self-reflectivity/poor mindreading
- intact basic self-reflectivity/preserved basic mindreading

Hypotheses

We predicted that

- participants in our study with deficits in both self-reflectivity and decentration would have poorer neurocognitive function than participants whose basic self- reflectivity was intact but who also suffered from a lack of decentration.
- participants without either metacognitive deficit would have the best neurocognitive test performance.

RESULTS

Both groups with **intact self-reflectivity** performed **better** than the more **impaired** group in a test to identify emotions from facial expressions and vocal intonation.

Possible Interpretation

human beings need the ability to recognize emotions in themselves in order to be able to recognize emotions in the expressions and voices of others. When this ability is compromised in schizophrenia, persons may lose the ability to detect emotions in others and manifest negative symptoms

Better performance in reading others' faces and voices

linked with

absence of self-reflectivity

but not of

mindreading

This finding supports the idea that mindreading processes are both interrelated and dissociable: the reading of a face depends on self-reflectivity but is not influenced directly by cognitive mindreading

Single cases of schizophrenia psychotherapy patients

(Lysaker et al., 2005b; Lysaker et al., 2007; Lysaker & Hermans, 2007).

Over the course of years of psychotherapy patients with schizophrenia first achieve awareness of their own thoughts and feelings and then later develop a sense of others having independent relationships with one another.

In one case study of the psychotherapy for patients diagnosed with schizophrenia it appears that there was first an increase in self-awareness, from as early as the third month, while there was no increase in awareness of other's mind until 17 months

Lysaker et al., in press The recovery of metacognitive capacity in schizophrenia across thirty two months of individual psychotherapy: A case study. *Psychotherapy Research*

TREATMENT IMPLICATIONS

If dysfunctions in metacognition are at issue here, the possibility of treating them may hold out enormous promises for the rehabilitation of even the most severely ill. A complex account of these difficulties may lead to the refinement of existing treatments and creation of new treatments which assist patient's to not only become more aware of their own thinking but plot and own their own course towards recovery.

The treatment of patients suffering from severe metacognitive disorders seems to meet greater difficulties compared to that one of patients with a good ability to understand mental states.

Psychotherapy is a relational context where, through a communicative exchange, patients are helped to understand and master those psychological processes behind their subjective distress or their difficulties of adaptability. If the patient has difficulties in guessing and describing his/her own inner states and understanding the other's thoughts and intentions, both the quality of the communication and the therapeutic relationship between the patient and the therapist are problematic.

The therapeutic alliance is difficult to build and the communication between the patient and the therapist is reach in misunderstandings and blocks that are difficult to overcome. The therapist gets from the patient insufficient, fragmented and chaotic information on mental states and has difficulties in planning a shared plan to help the patient to reduce distress, master symptoms and give a new sense to social relationships. Then the patient hardly understands the therapist's intentions and hardly uses them to reason upon him/her self.

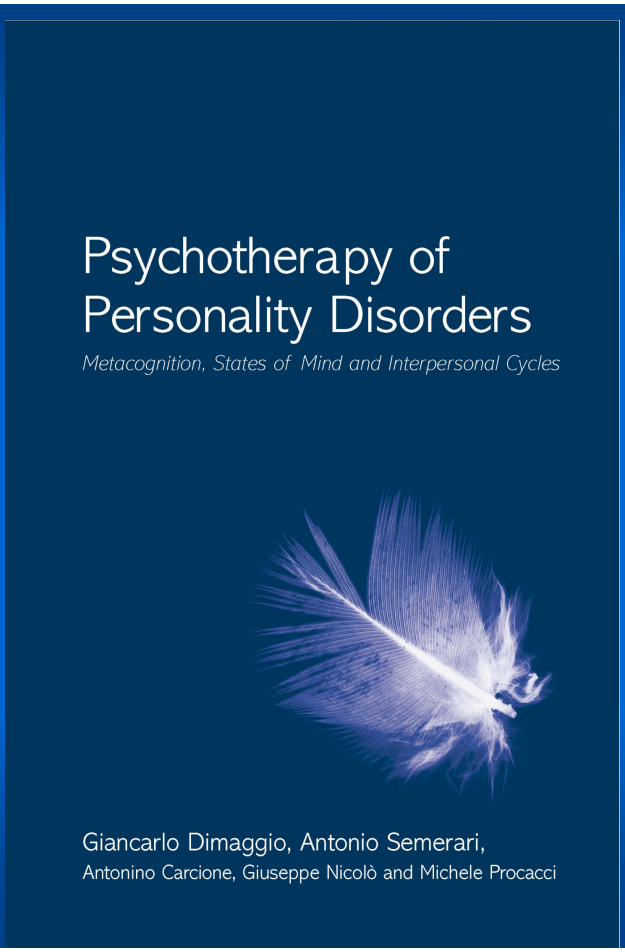
A further problem is that there is not a unique metacognitive disorder, but different patients and different disorders present problems in specific metacognitive sub-abilities. Some patients will have difficulties in recognizing their own inner states, others instead will have difficulties in reading other's mind in a non-egocentric way, others will fail in both the tasks.

Therefore, in therapies with patients suffering from metacognitive disorder there will be common relational problems and problems specific of the different disorders.

Patients with Personality Disorders (PDs) hardly find their way to form a nuanced understanding of mental states. The clinician have to resort to a wide array of techniques to apprioprately regulate the therapy relationship in order to let these patients describe their inner world, understand the others and create an image of the therapists not paralleling their internalized figures.

METACOGNITIVE INTERPERSONAL THERAPY

Metacognitive Intepersonal Therapy, especially tailored for treating PDs, has developed strategies to improve patients metacognition in session and to help them maintain and maximize gains between sessions and in the long term.



Interventions targeted at bringing the attention of the patients to their inner states.

The therapist first encourages the patients to narrate specific episodes instead of general opinions about their life and the world, in a very defined space and time and then prompt for an accurate description of the dialogue occurred during the event and the emotions and thoughs passing through the patient's mind.

Then the therapist invites the patient to reflect about the causes for his or her reaction. When the patients are unable to describe their feelings, the therapist focus on the patient's bodily signals and mimicry and then further explore them.

Interventions via the therapeutic relationship.

The therapist tries to create a shared discourse in which patients feel at ease, so finding easier to access to their mental states.

The therapist tries to avoid early confrontation and prefer exploring areas the patients agree to.

During moment of ruptures in the relationship, when the patients are warding themselves off or refuting any therapist's idea, the therapist might self-disclose, for example retrieving a well-mastered episode from his or her own life that appears similar to what the patient is experiencing now.

The therapist explores the reactions to the self-disclosure and in particular if this has promoted greater access to mental understanding.

To improve understanding of the other's mind the therapist might invite the patient to freely discuss what the patient thinks the therapist is thinking or feeling toward him or her and then debate on the topic. This allows the patient to discover, for example, that the other is not angry at or criticising him or her as he or she felt beyond any doubt.

The relationship between metacognition and subjective experience

Influence of poor metacognition on contents

It is plausible that poor metacognition influences the construction of experience and the possibilities treatment has of modifying it. In fact, numerous single case studies involving patients not suffering from PDs (Stiles….) and initial observations regarding Borderline PD (Osatuke & Stiles, 2006) demonstrate that limited self-reflection prevents patients from acknowledging problematical contents and emotions, launching strategies for the modulation of unpleasant aspects of experience or feeling a sense of personal efficacy when tackling their suffering.

During good outcome therapies patients become better at accessing previously hardly acknowledged aspects of their inner worlds and, as a result, their narratives become richer in contents (Stiles….)

Difficulties in comprehending that others have an existence independent of self and their own emotions and feelings, i.e. the lack of an allocentric perspective (Frith & de Vignemont, 2005) make some patients treat therapists as if they were not persons with their own emotions and feelings (Fonagy 1991; Bateman and Fonagy, 2004) and lead them to, for example, show lack of respect or not take account of setting rules.

Such metacognitive impairments prevent the forming of a positive atmosphere in therapy (Dimaggio et al., 2007).

If these considerations are valid, then improving PD patients' metacognition should trigger a change in their experience contents. For example, with an increase in self-reflectivity, emotional experience ought to become enriched and a patient might, initially in the background, experience pleasant states or find unpleasant aspects and work on them (Stiles…).

A better understanding of other's minds - and the forsaking of an egocentric perspective – make it possible for patients to understand how their constructions of others, including their therapist, are biased and unbalanced. With a more sensitive reading they are able to notice positive aspects in others, for example a readiness to help, which, as a result, transport the self to more pleasant states (e.g. feeling cared for or relaxed).

Influence of contents on metacognition

A change in contents influences the ability to reflect on states of mind. For example, ex

periencing positive emotions increases insight (Tugade & Fredrickson 2000).

Non-clinical populations: individuals ascribe more mental attributes to targets they like (Kozak, Marsh & Wegener, 2006).

When targets are presented as victims in a state of suffering, individuals tend to disparage and dehumanize them and ascribe less states of mind to them (Lerner, 2003; Kozak et al., 2006).

When individuals are induced to distrust a target, this spontaneously activates message-incongruent associations, as they consider what might happen if the message is invalid. Receivers who distrust a message do something similar to individuals who fancy about "what might have been", a process termed counterfactual thinking (e.g., Roese, 1997; Schul, Mayo & Burnstein, 2004).

In other words, distrusting individuals engage in *more* mindreading and construct multiple scenarios of other's thoughts, which, however, do not modify their negative image of the latter and are of no help in escaping from the initial mistrusting state.

Patients with BPD were compared with healthy controls and only displayed poorer self-referential source memory as regards Hostility measures including suspiciousness, but not related with Depression (Minzenberg, Fisher-Irving, Poole & Vinogradov, 2006).

In a second study 43 BPD patients and 26 healthy controls were compared in emotion recognition (facial, prosodic, and integrated facial/prosodic) tasks, non-emotional facial feature recognition, and interpersonal antagonism. BPD patients displayed a normal ability to recognize isolated facial or prosodic emotions but had impaired recognition of emotions in integrated facial/prosodic stimuli, as well as impaired discrimination of non-emotional facial features. The impairment in BPD was associated with interpersonal antagonism, particularly suspiciousness and assaultiveness (Minzenberg, Poole & Vinogradov, 2006).

In both studies it appeared that the different types of metacognitive impairment are not generalized to all situations but only associated with particular contents of experience, e.g. hostility.

Link between alexithymia - a measure conceptually correlated with an aspect of metacognition, i.e. self-reflectivity - and interpersonal problems in a sample of patients, of which half diagnosed with PDs. The clinical group was more alexithymic than the controls and the alexithymia selectively correlated to two interpersonal functioning patterns: cold-distant and non-assertive (Vanheule, Desmet, Meganck & Bogaerts, 2006). In this case too aspects of impaired metacognition appeared to be linked to specific contents of experience.

Hypothesis

To summarize, there is substantial literature pointing to influences of both metacognition on contents and contents on mindreading. The hypothesis of a correlation between the two phenomena during therapy therefore appears worth investigation. In fact, in preliminary research a positive correlation among positive emotion patterns, metacognitive functioning and good therapeutic alliance was found (Marini, Basile, Dimaggio, Carcione, Nicolò & Semerari, 2006).

The relationship between the two elements during treatment has various facets. Contents – thoughts, emotions and descriptions of bodily states – vary among the various PDs. One passes, for example, from the disdainful anger that narcissists feel towards someone excluding them or obstructing their goals (Dimaggio, Fiore, Lysaker et al., 2006), to paranoids' diffidence, (Millon & Davis, 1996) dependents' feeling of being abandoned (Carcione & Conti, 2007) or borderlines' suicidal despair (Linehan, 1993). It is plausible that different aspects of experience respond differently to improvements in metacognition. A dependent's anxious state might, for example, respond rapidly to treatment, while a paranoid's aggressiveness might, in the short term, be less responsive. We have, therefore, selected a sample of patients suffering from PDs in all 3 DSM IV clusters, in order to evaluate the impact of metacognition on a wide range of contents.

The changes we expect are various. Our general hypothesis is that an improvement in metacognition is accompanied by a better hedonic tone to experience: a greater ability to reason in terms of states of mind ought to be linked to a greater well-being. On the other hand, a better knowledge of one's inner states might be accompanied by more distressing contents or a temporary deterioration in the quality of experience in the early stages of treatment (or even later), with patients, in fact, becoming aware of their negative emotions thanks to therapy. Positive aspects of experience might, however, appear in their narratives and balance the negative contents.

Ours is a pilot study, carried out on a limited sample of 11 individuals. For this reason we restrict ourselves to exploring the correlations between metacognition generally and the hedonic quality of experience. We investigate whether the moments in which patients are successful or not in their metacognitive operations – i.e. correctly identify the causes of their behavior – correlate, respectively, to positive or negative experiences. We do not, on the other hand, explore correlations between specific aspects of experience (e.g. thought themes, emotions or somatic sensations) and individual aspects of metacognition (e.g. ability to identify affects).