

Adelaide, 11 March 2015  
by Mario Pigazzini  
Psychotherapist

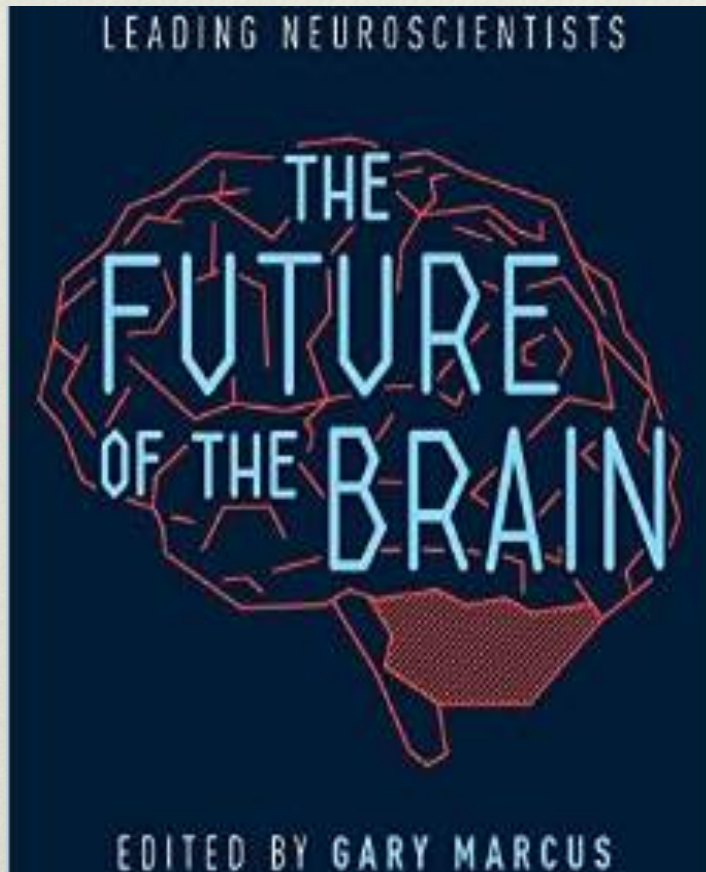


# Points I would like to share

- ❖ Psychotherapy, a *personal* structured *interaction*
- ❖ *Common ground* and *similarities*
- ❖ Mechanisms and principles
- ❖ Computation and *combinatorial* richness
- ❖ *Learning process*
- ❖ Bottom-up and *top-down* processes
- ❖ *Dialogue* between neuroscience and psychotherapy

# My last 2 books on NS

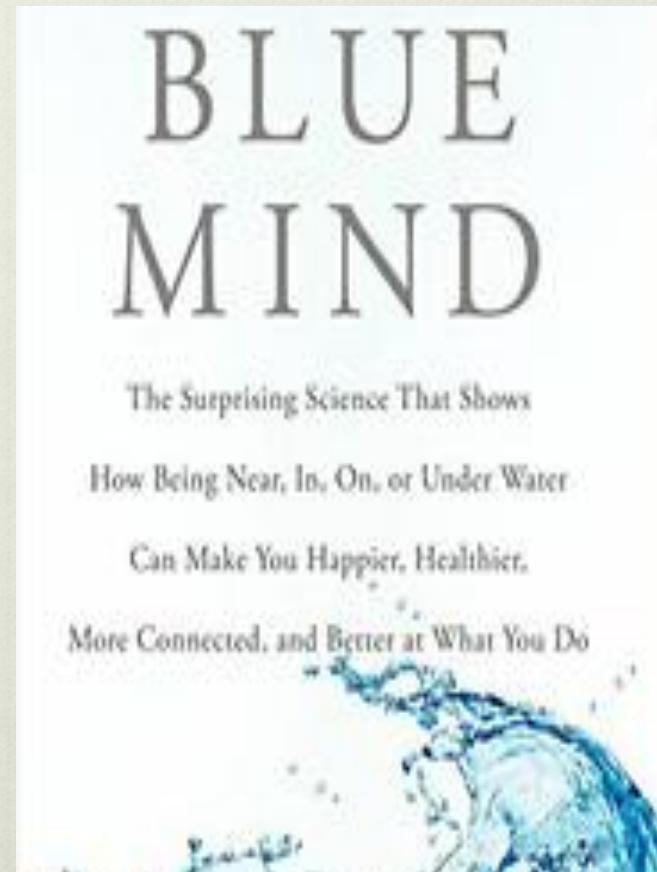
**From NS laboratories**



M  
I  
S  
S  
I  
N  
G



**To mental wellbeing**





# What is missing ?

**A book on the interactions  
between  
psychotherapy and neuroscience,  
regarding mental pain, distress or disorders,  
probably  
because it is not clear to neuroscientists what  
psychotherapy means,  
and to psychotherapists what neuroscientists  
know about human interactions.**

# Brain & Mind

in my 40 years of experience as psychotherapist,  
is the **coupled brain**  
of a client and his/her therapist.

Both the brains are **working together** toward shared  
experience

which means that client and therapist arrive  
**at the same time to the same inferences**  
on the client mental **here and now** experience.



A client come to the session. She tells about a dream. She was driving in a tunnel when her car stopped and the car's lights started to slowly turn off.

We started the usual work of connecting emotions and day experience to dreaming, with a good interaction. At the end I said: *and you feel like you are in an empty darkness.*

*These are my words, how did you read my mind?* she said.

# Coupled brains

Psychotherapy is a  
relational experience  
based on a *specific structured interaction*  
*between two persons*  
which we call: *take care of...*

From animals to humans *how* the  
parents *take care of* their babies  
determines *part* of the future *mental*  
functioning in the adults.

(Frans de Waal, Prometeo, n. 127, September 2014, pg. 133 et s.)



# Psychotherapy as taking care of

Targets a **temporary reactivation**  
of some quality of development, in order to  
**understand, control and modify,**  
those parts of the parental **codes** which  
are **imprinted** in the subject and  
prevent her/him from wellbeing.



# Is it a bridge too far between circuits and two coupled brains?

It is well known that there is a **big gap** between circuits and behaviour .

*The brain is undeniably an information-processing organ ... Computer analogy illustrates a general rule in science which is to seek an appropriate level of description ...*

*This level ( of computation ) is intermediate between detailed mechanism (reductionism) and overall function (holism).*

# Looking for common language

The question arises: what kind of help can neuroscience offer to psychotherapy if the two disciplines are so far apart?

Carandini writes: ... *researchers of circuits and of behaviour go furthest when they **speak a common language** of neural computation, a language that we are only beginning to learn.* (pg. 184)





**Psychotherapists**  
have lots of theories,  
but have no data;  
**neuroscientists**  
*are awaiting a theory*  
(Marcus, pg. xi)  
but have a lots of data.

# From the rivers of ...to the sea of $\psi$

Neurosciences	A modern model of taking care, scientifically autonomous, which avoids to medicalize manifestations of distress, <b>must integrate the knowledge coming from various disciplines,</b> in one well organised conceptualisation, <b>able to explain</b> how the interactions between two persons work.
Evolutionary Psychology	
and Anthropology	
Ethology	
Information theory	



# Unconscious abstract levels

I would like to introduce a clinical vignette to illustrate some concepts and ... our laboratories.

*A man comes to my consulting room: waiting for him at the door I realised he was walking in a strange way. He sat down.*

*“I feel **nervoso**” (nervous) he said.*

I understand **melmoso** (trapped in mud). “Sorry, what did you say?” The client said: “**Nervoso. ...** What did you understand?” “**Melmoso**” I answered.

After a pause: “**Yes, you are right**” he said.

*We then have a wonderful session on how he feels like to be inside the quagmire full of anger and distress because of ...*

# *Different levels of signs complexity*

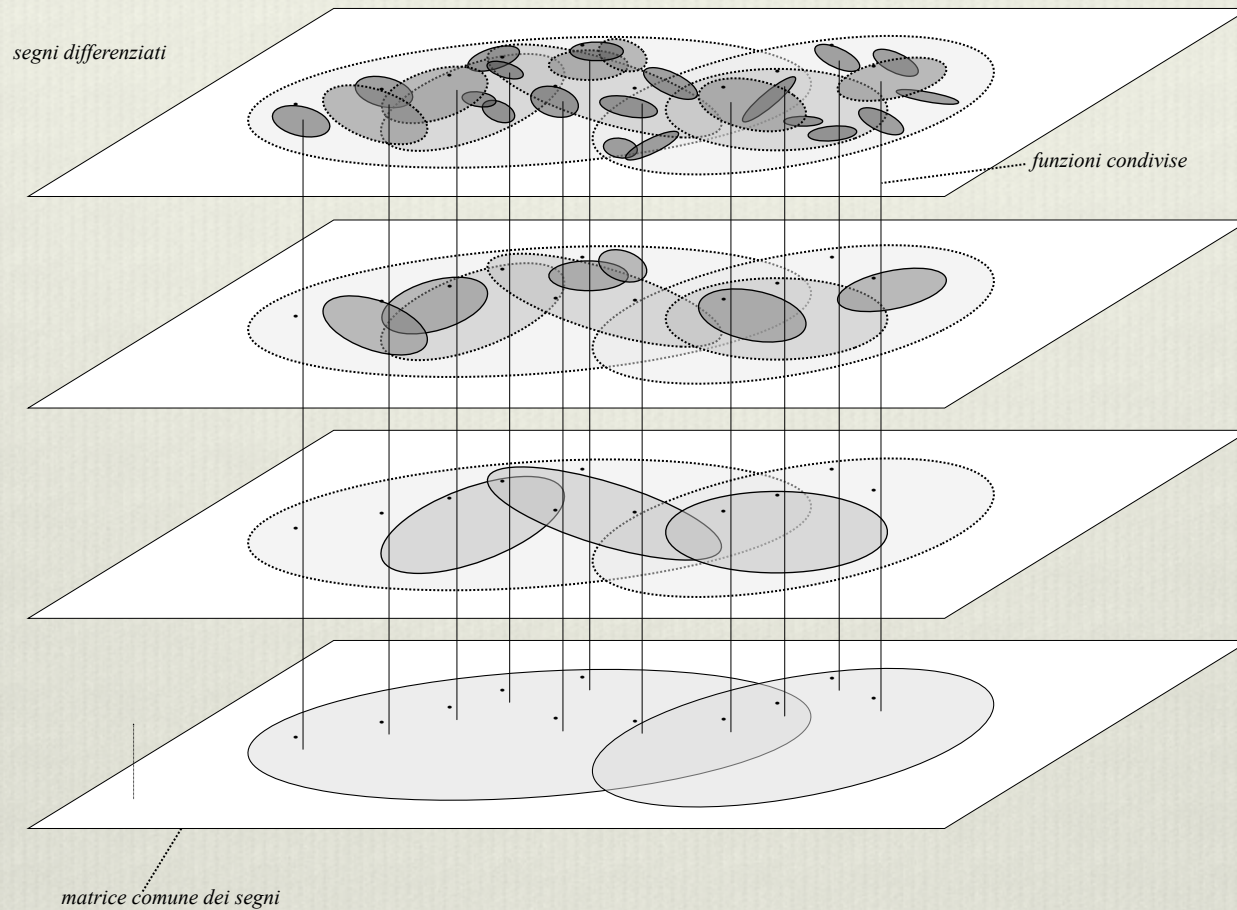


fig.26

Giampaolo Sasso  
presentazione 25.10.14



# Four processes of human existence

- ① **Evolution: Individuals competing for survival and reproduction;**
- ② **Development: by growth and patterning;**
- ③ **Learning: by changes in neural connections;**
- ④ **Culture: by human behaviour and interactions.**

**E. Coen, *Cells to civilizations*, Princeton U. Press, 2012**

**Psychotherapy as a combinatorially  
rich interaction  
between patient and therapist**

**Combinatorial richness,**  
*which is*  
*the arrangement of words and letters of a*  
*language, the juxtaposition of ideas or*  
*materials,                      or encounters among diverse*  
*people.*(idem)



# Computation and combination

*different computations are typically consider to work in combination.*

*... the various ways the computations are **combined** in different brain regions and modalities.* ( Carandini, 2015)

What is combinatorial richness?

*The range of combinations or patterns that can be generated from a model **defining the correspondence** of the theory or model to the phenomena **other then** those was first used to explain.* ( Deutsch, 1966)

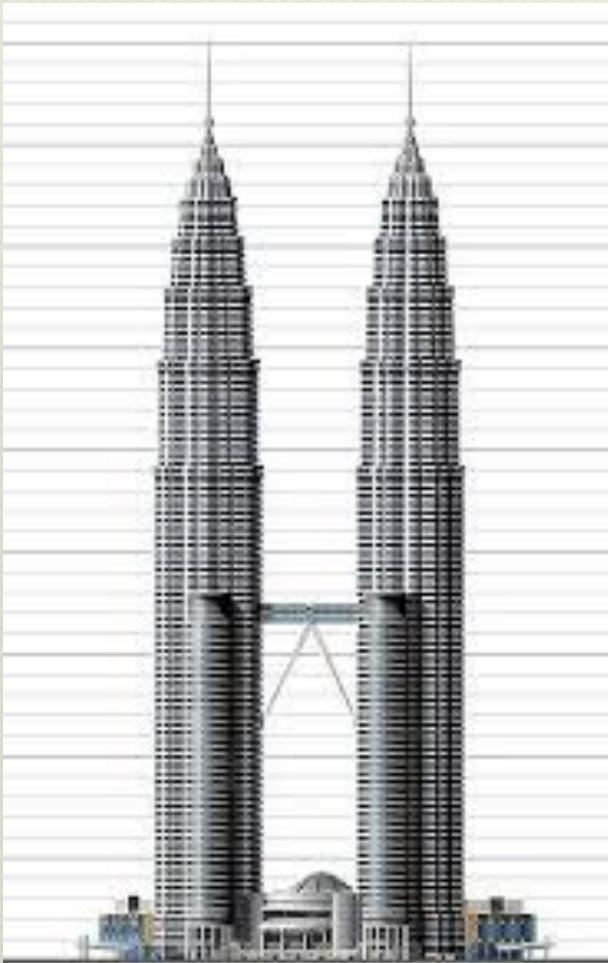
## Combinatorial Richness

Is an ability to **create a wide diversity of novel entities from a limited repertoire of constant elements.**

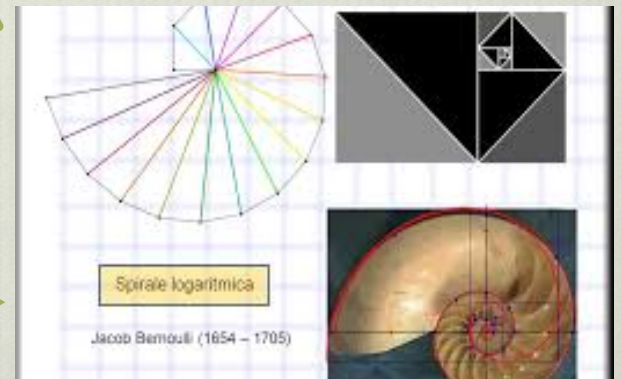
Favours the **emergence of novelty**, which is enhanced by both heterogeneity of components and by the presence of process that enable heterogeneous elements to combine.



# Three models of $\Psi$



Symbolic  $\uparrow$   
Narrative  
Relational  $\leftarrow$   
Scientific  $\rightarrow$





1  
The symbolic narrative model is the original model of psychotherapy, the **talking cure** applied by Freud and others at the end of 1800's;



it was always linked to the clinical pathology requiring **medical cures**.

It never abandoned this contradiction, so it failed to become an autonomous science.



## 2 Taking care is primarily

an evolving interaction between 2 persons.



The best hypothesis of how the neo-cortex works is that it is a hierarchical array of future detectors, proceeding from bottom-up sensory information to higher-level more abstract concepts.

( Marcus, pg. 211)

# Do you perceive my pain?

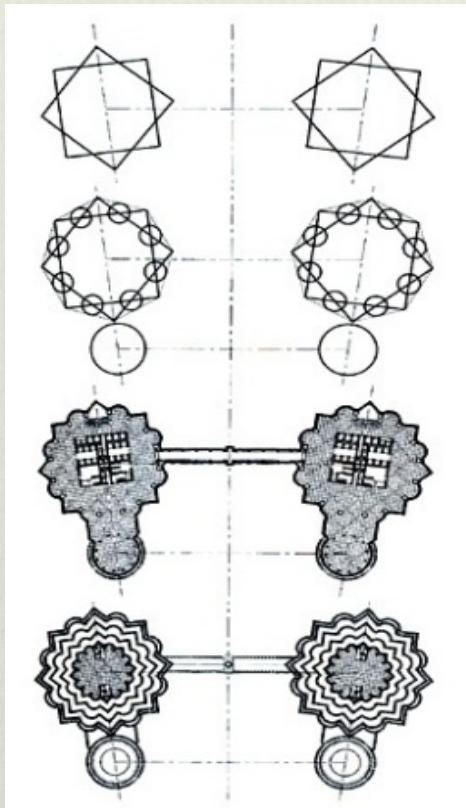
Psychotherapy, as an interactive process,  
is a **combination of** meanings, feelings and  
emotions, which are embodied.

- ❖ Lapse, omission, ...
- ❖ Counter-transference intuitions
- ❖ Emotional perceptions
- ❖ Painful bodily experience

**All these therapist's descriptions are Top-down (?)**



# Top-down process

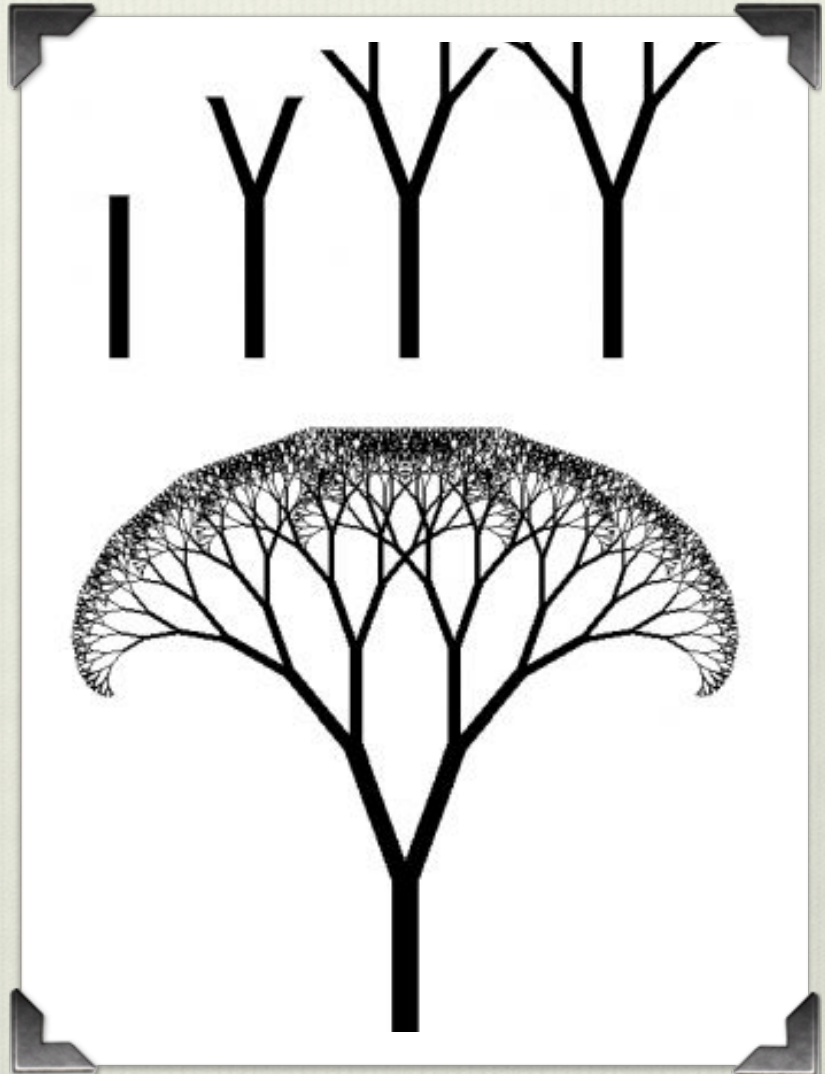


Top-down processes are based on a rudimental information; when analogy has been found in the high-level brain function, suddenly the associate meanings are activated.

From analogy to association to prediction

# Analogy, the difference within similarity

Analogy  
is the link between  
a new input  
and similar  
familiar information  
which already exist  
in memory.





# 3 The scientific models

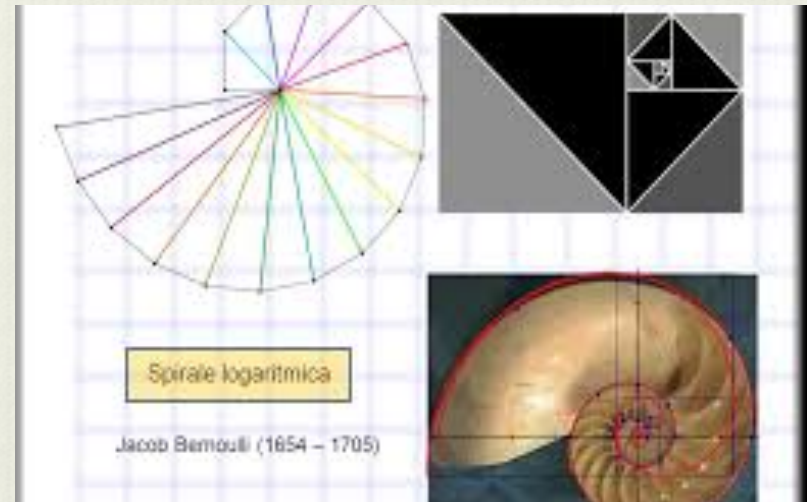
Because psychotherapy is a recursive process,

it is possible to identify some mathematical relations

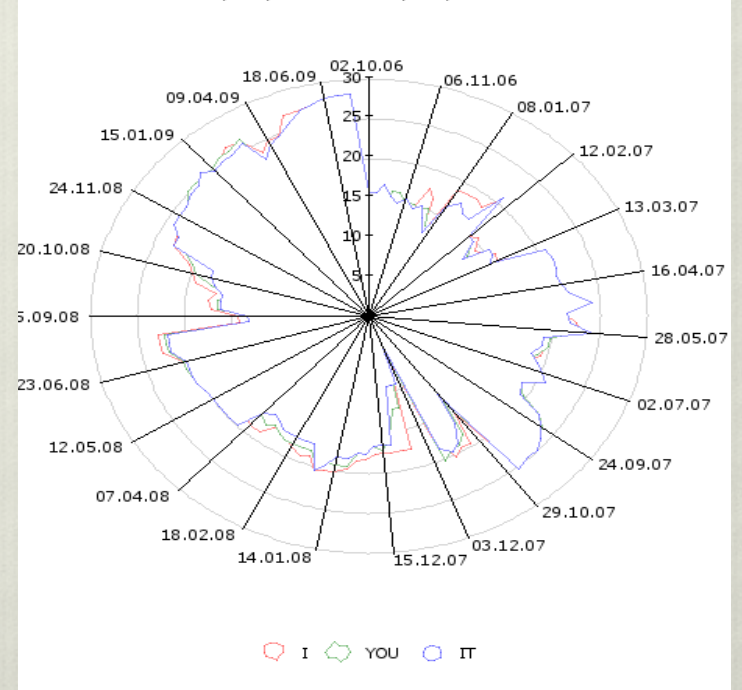
between the variables of models which measure the evolution of change,

like the logarithmic spiral.

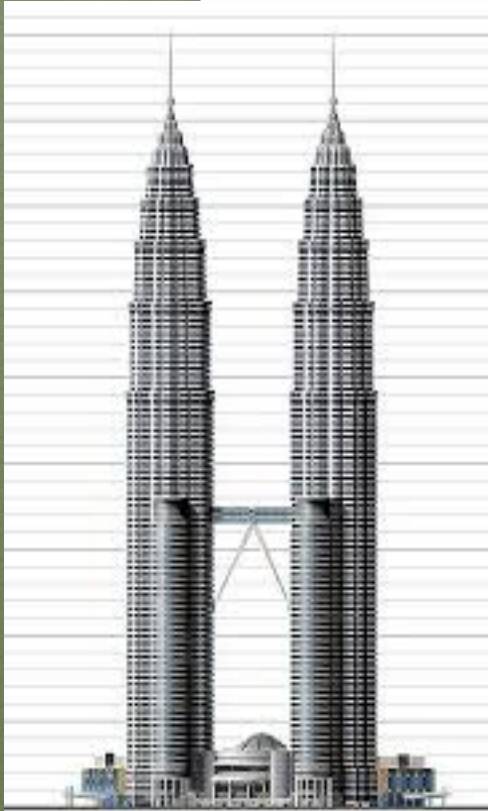
**The research of new mathematical models is just beginning.**



.701.02015 - 22/06/2006 - 22/06/2010 Sessions = 114







It is a deep learning process by which the stored information, is activated by novelty via sensory input. The interaction with a coupled brain manipulates, via a combination of computation, the new information in order to achieve more solid behaviours.

# What is psychotherapy