

M U N I

M E D

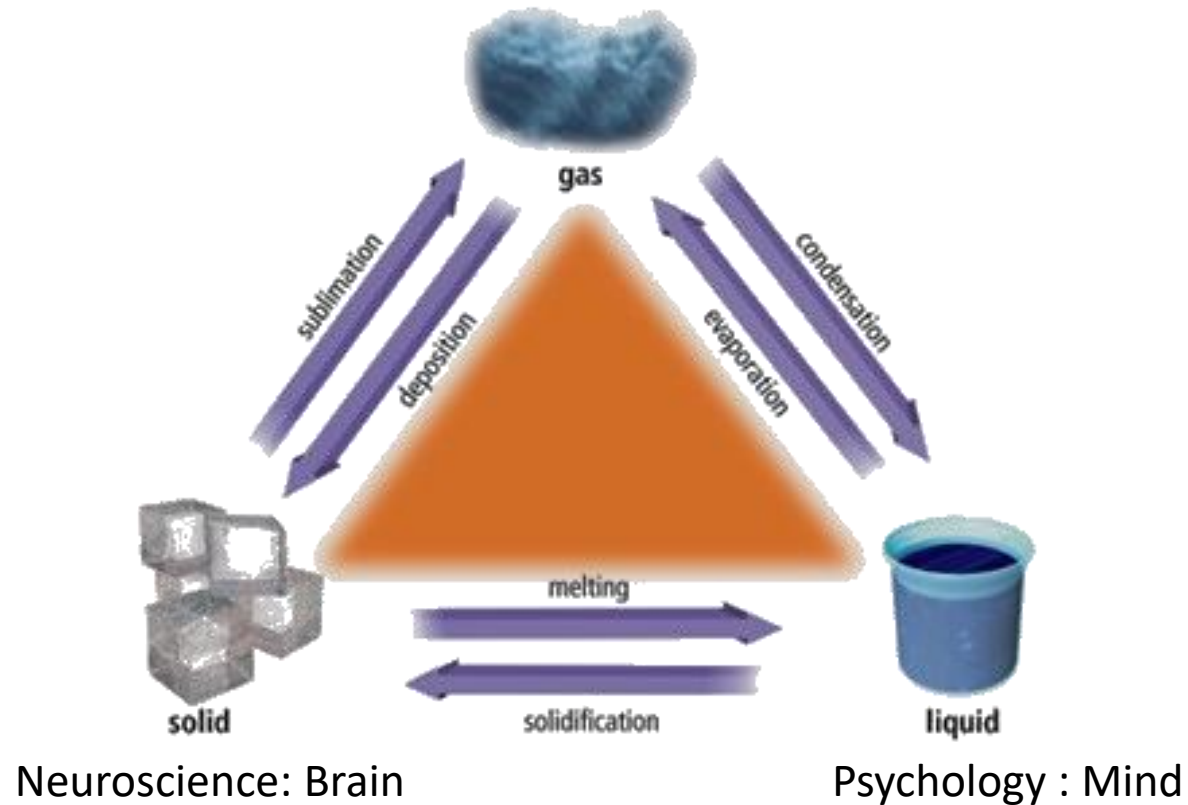
# **The Highest Level of Cerebral Activity I**

# Three States of Cognition

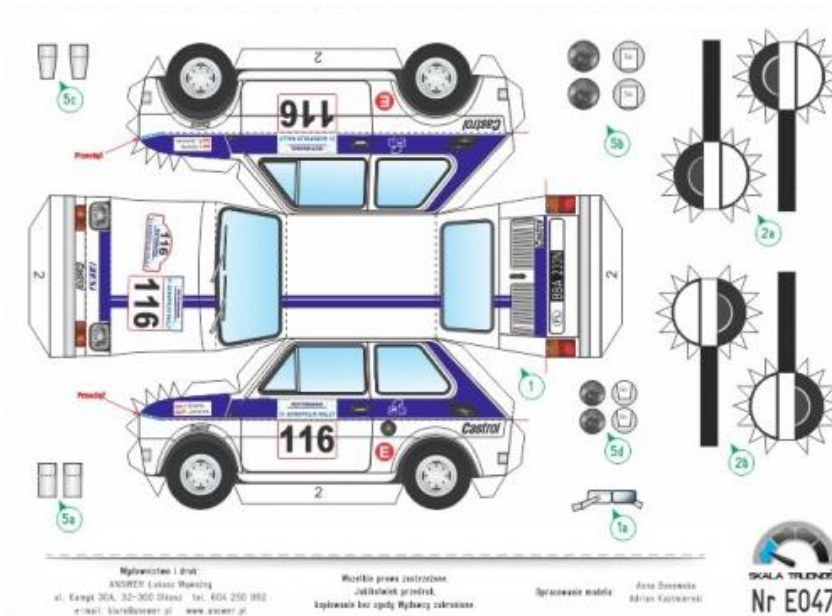
Philosophy : Mind behind Mind



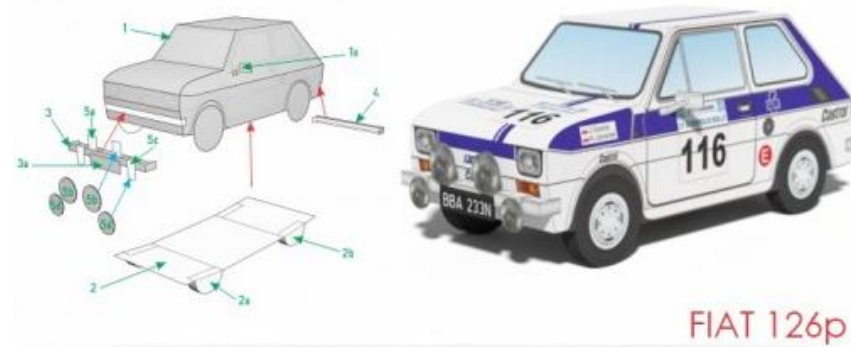
PS Deb



# Three States of Cognition



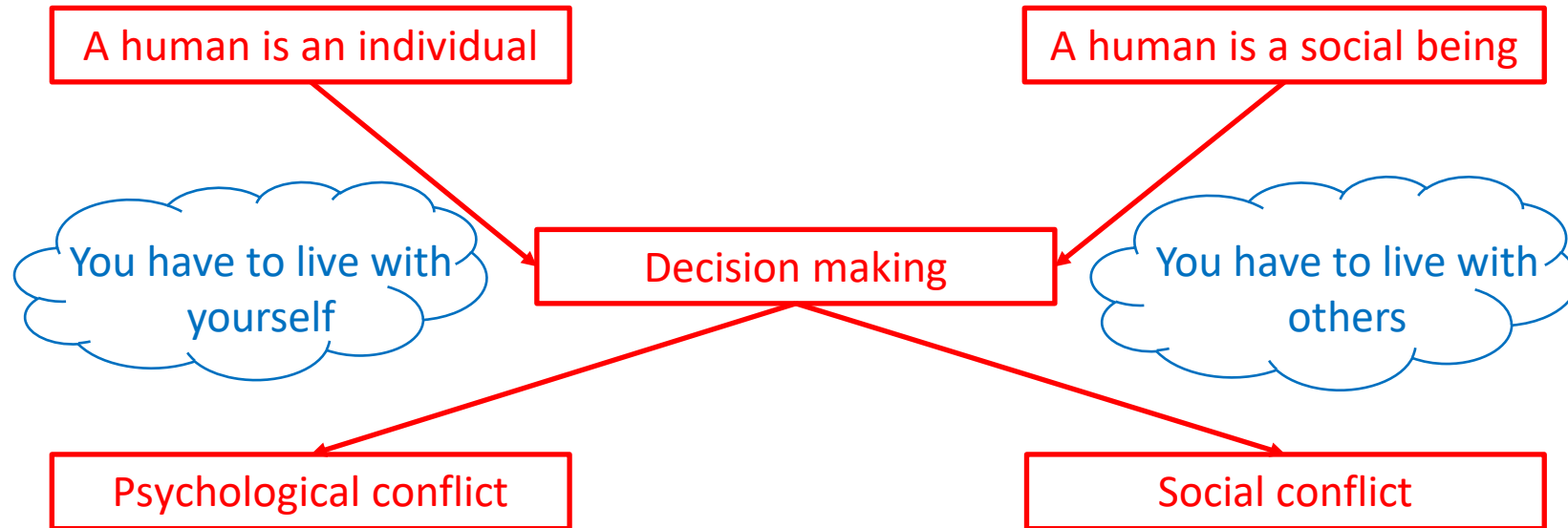
# Three States of Cognition



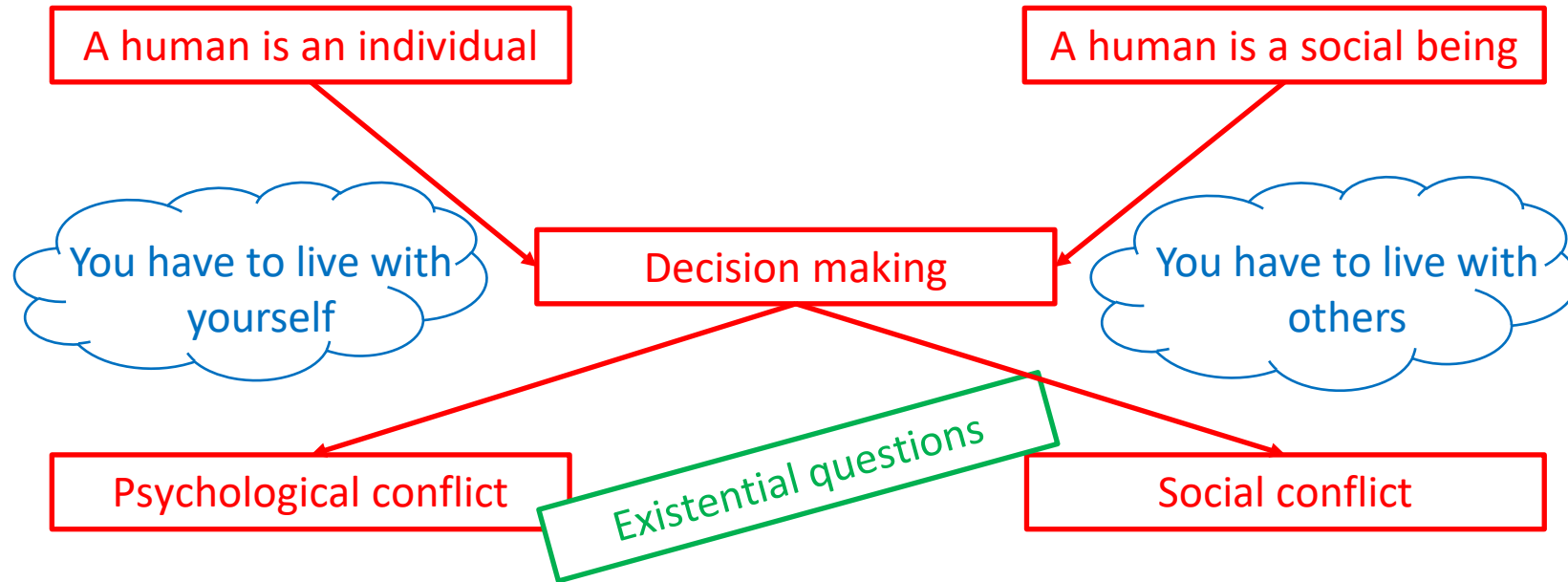
# Why?



# Why?

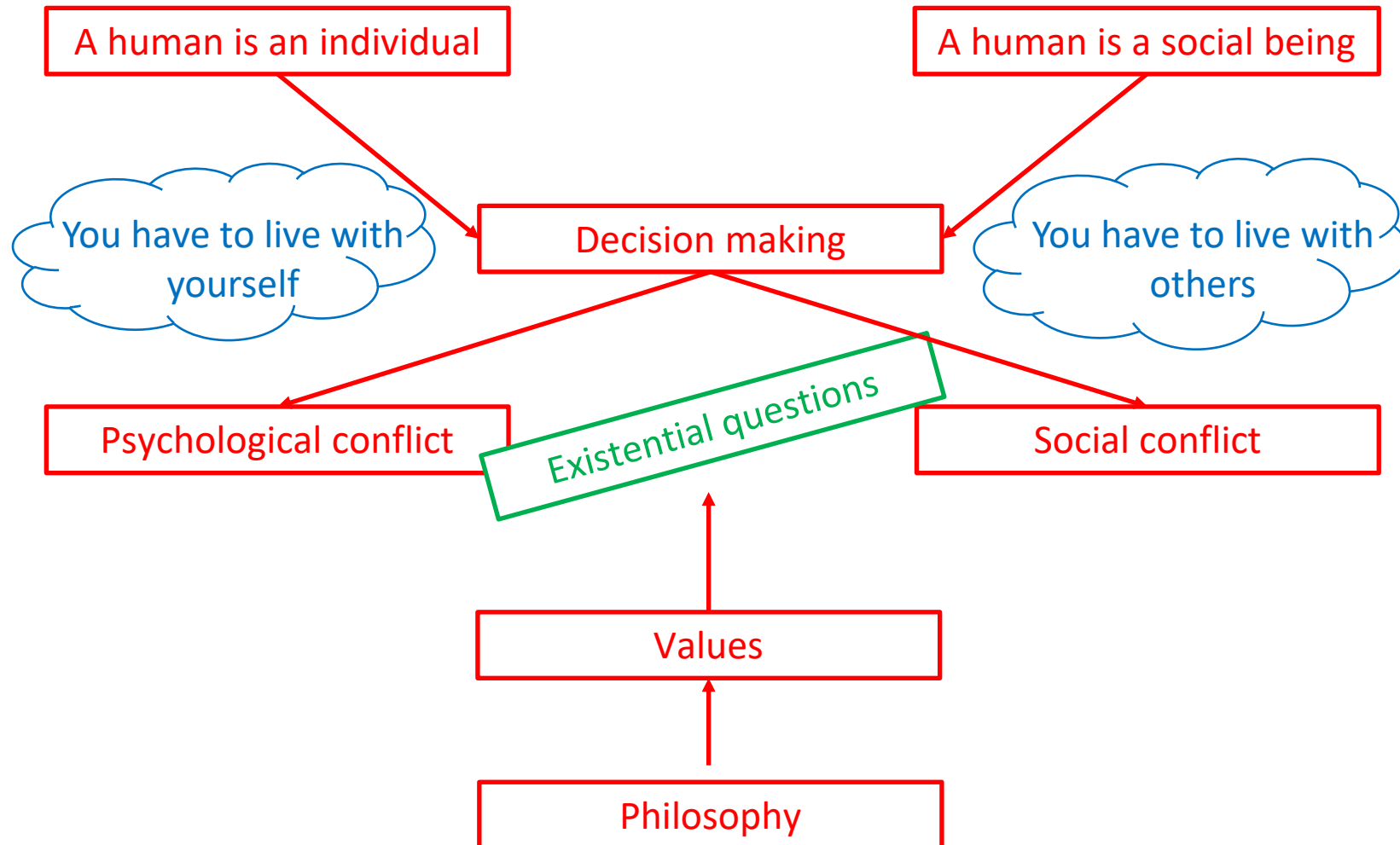


# Why?





# Why?



# Philosophy

**Philosophy of life** is a personal philosophy, whose focus is **resolving the existential questions** about the human condition.

Wikipedia

# Philosophy

## FORMAL PHILOSOPHY

**Philosophy** is the study of **general and fundamental problems** concerning matters such as existence, knowledge, values, reason, mind, and language.

Wikipedia

## INFORMAL PHILOSOPHY

**Philosophy of life** is a personal philosophy, whose focus is **resolving the existential questions** about the human condition.

Wikipedia

# Philosophy

## FORMAL PHILOSOPHY

**Philosophy** is the study of **general and fundamental problems** concerning matters such as existence, knowledge, values, reason, mind, and language.

Wikipedia

## INFORMAL PHILOSOPHY

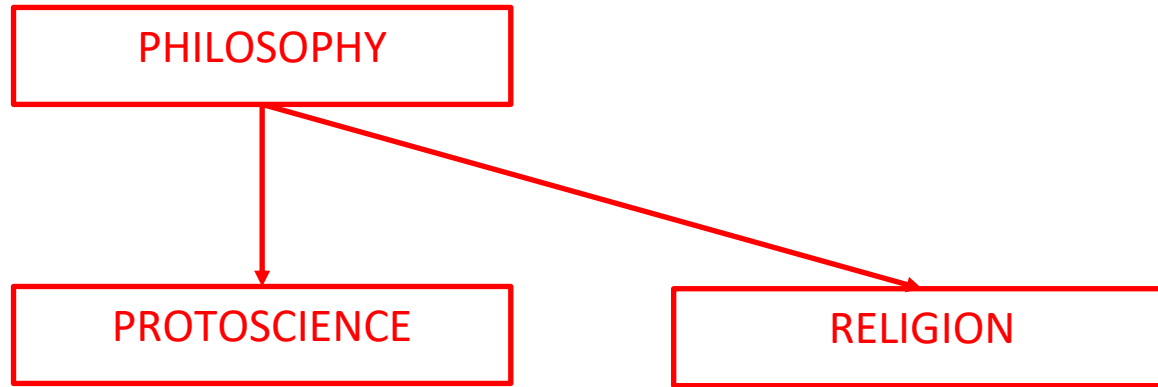
**Philosophy of life** is a personal philosophy, whose focus is **resolving the existential questions** about the human condition.

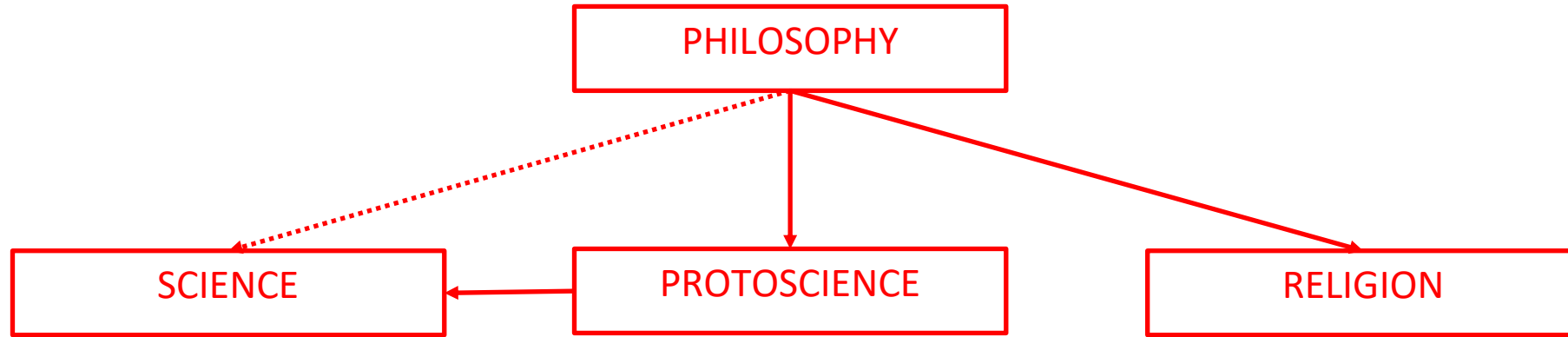
Wikipedia

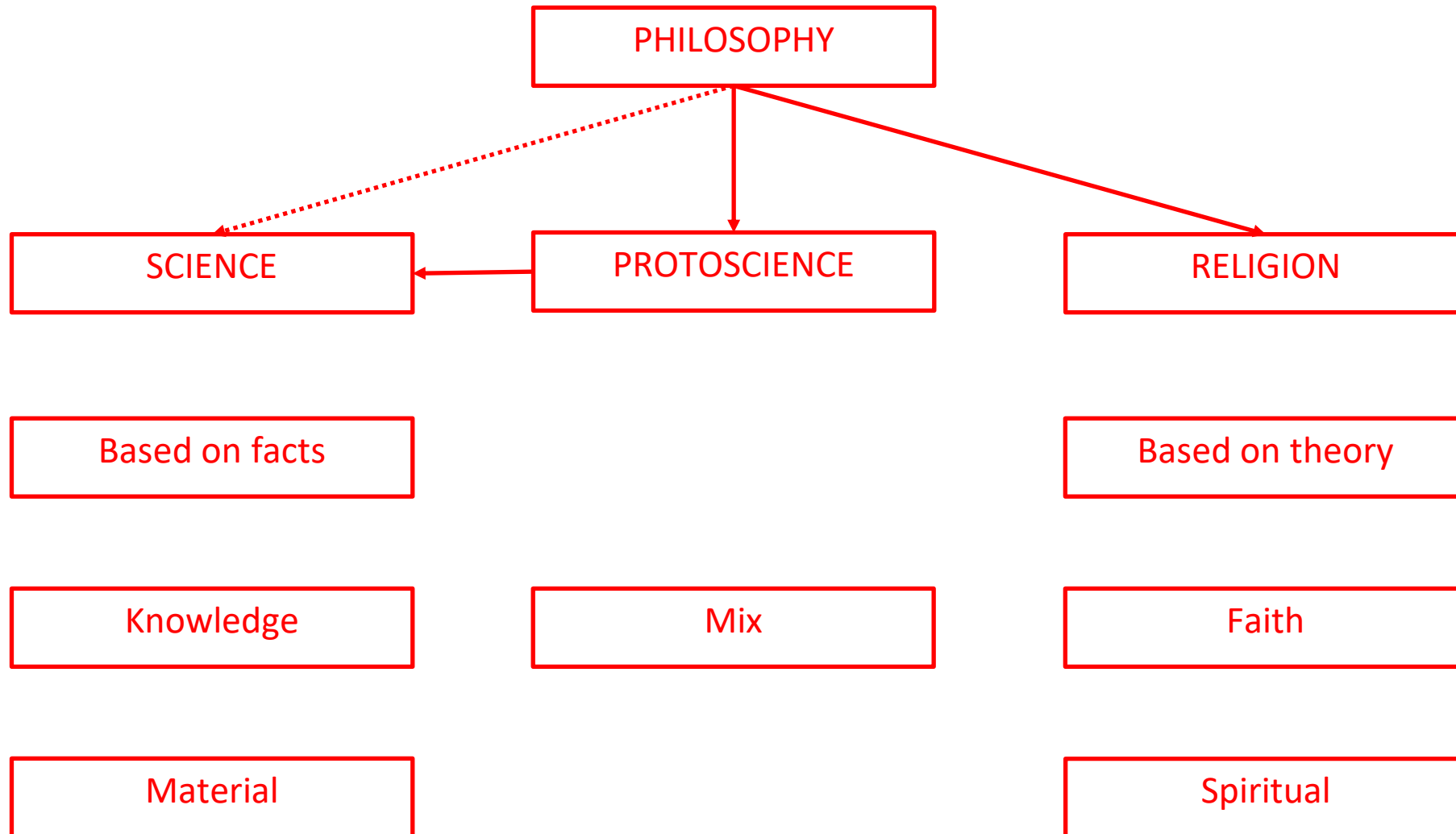
## COLLECTIVE CONSCIOUSNESS

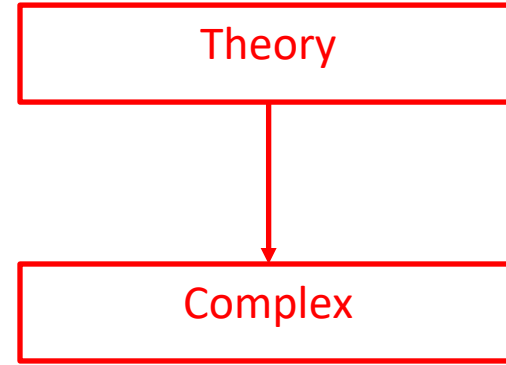
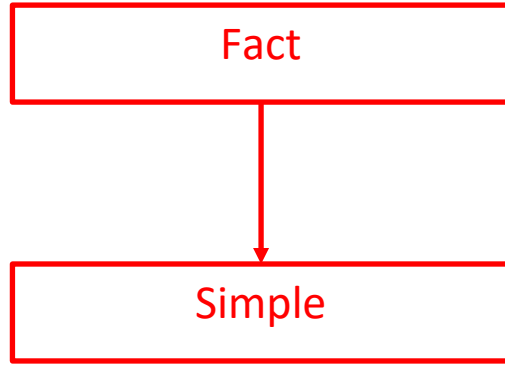
**Collective consciousness** or collective consciousness is the **set of shared beliefs, ideas and moral attitudes** which operate as a **unifying force within society.**

Wikipedia

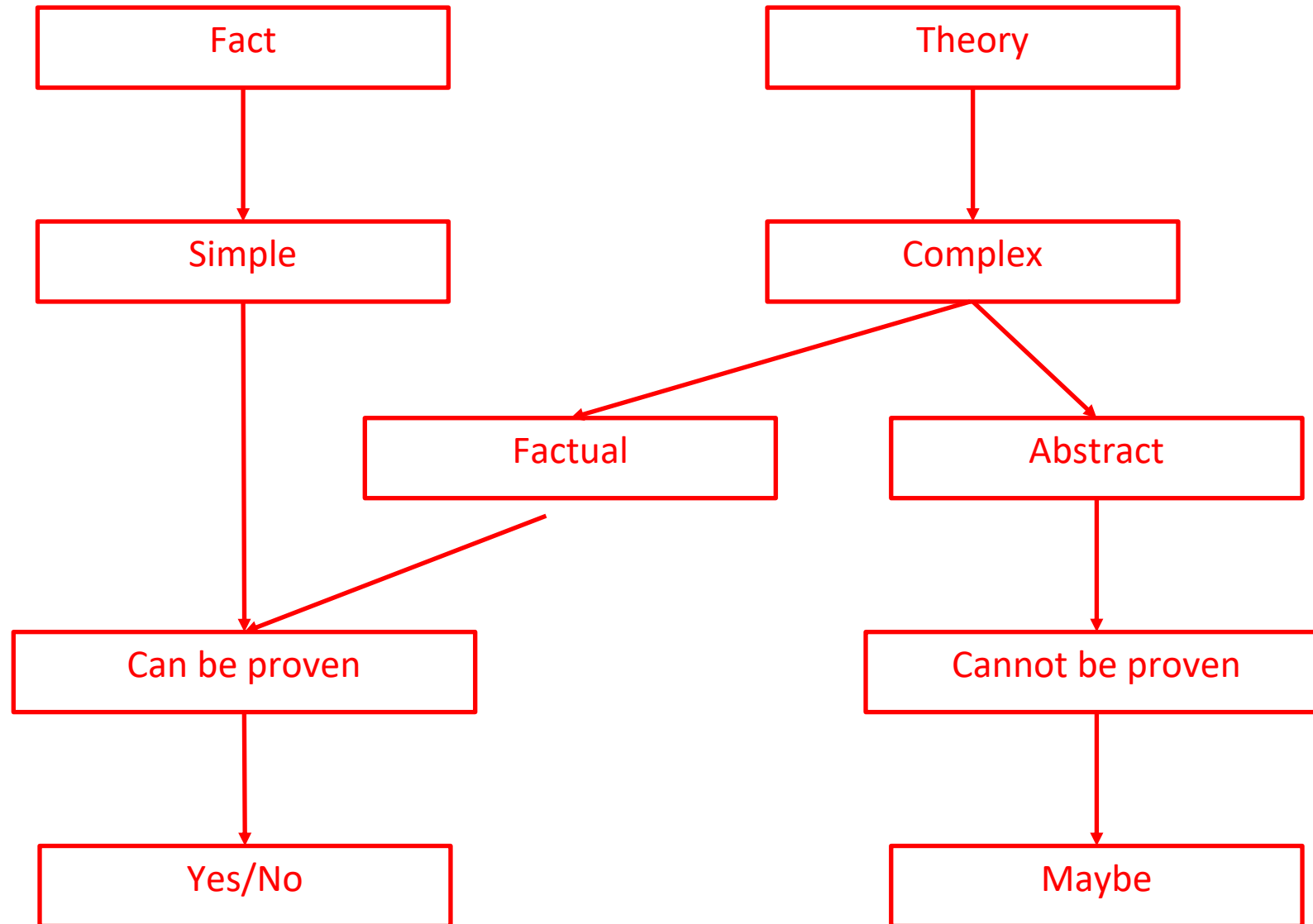


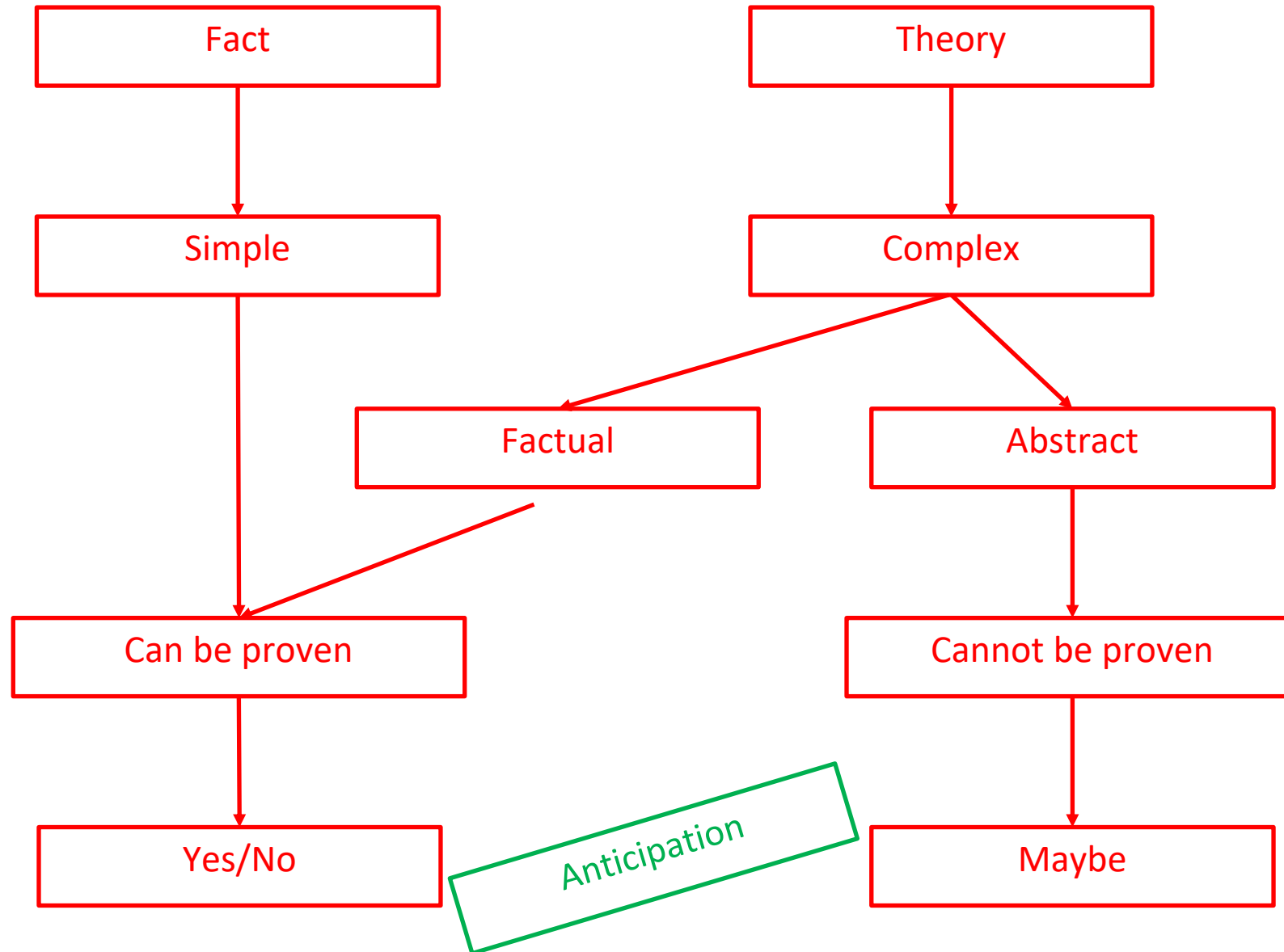




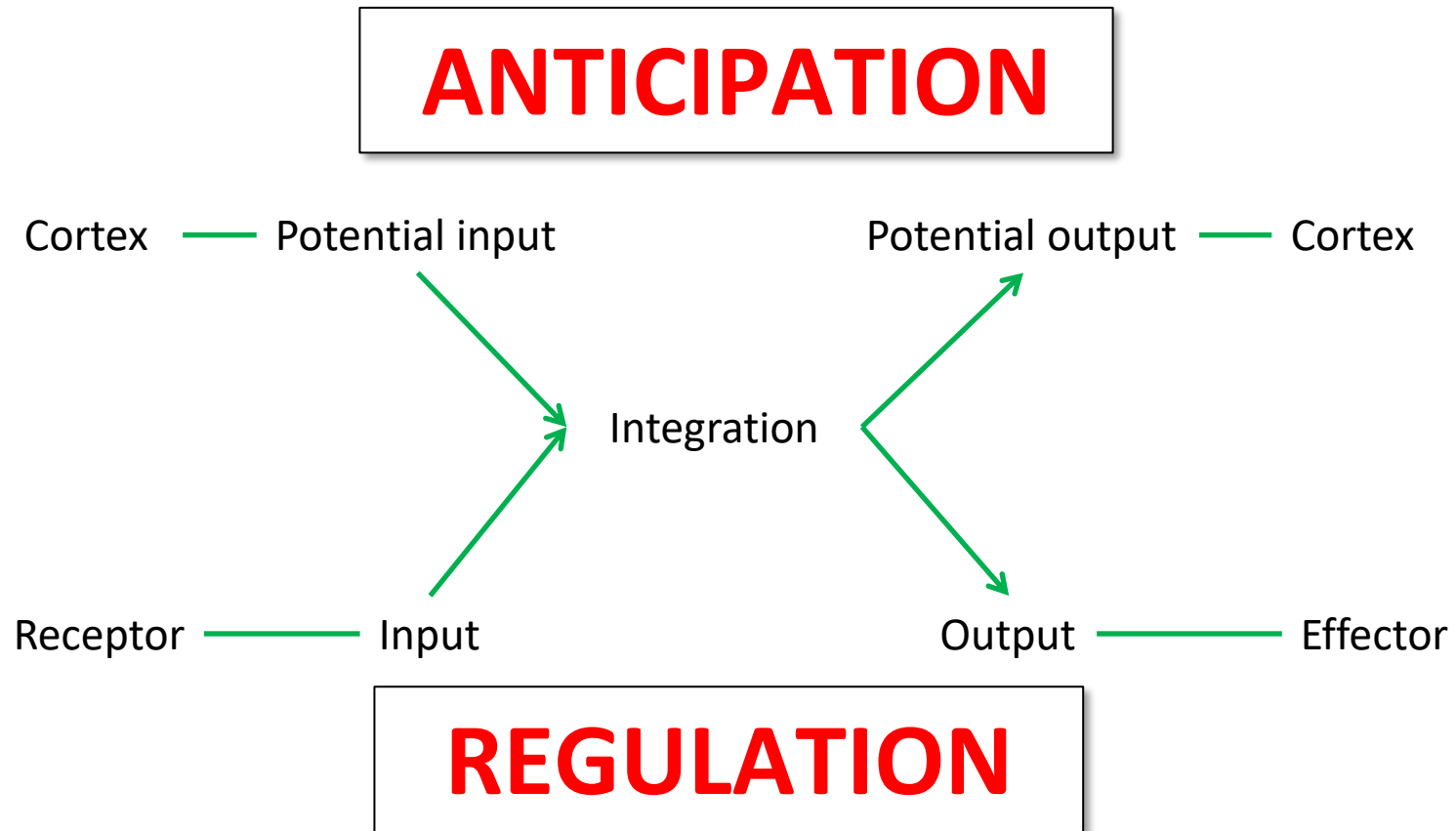








# The role of nervous system

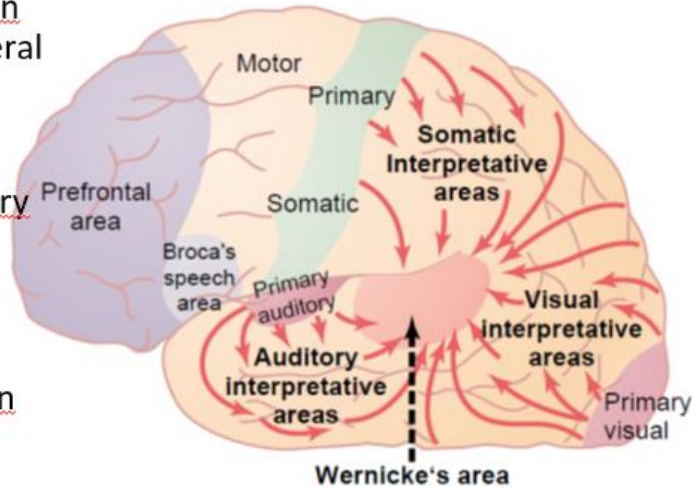


# Complementary ways of thinking

## Parieto-occipito-temporal association area

Analytical functions

- Linking and interpretation of information from several sensory modalities
- Visual – acoustic – sensory analysis
- Object recognition and categorization
- Language comprehension
- Attention



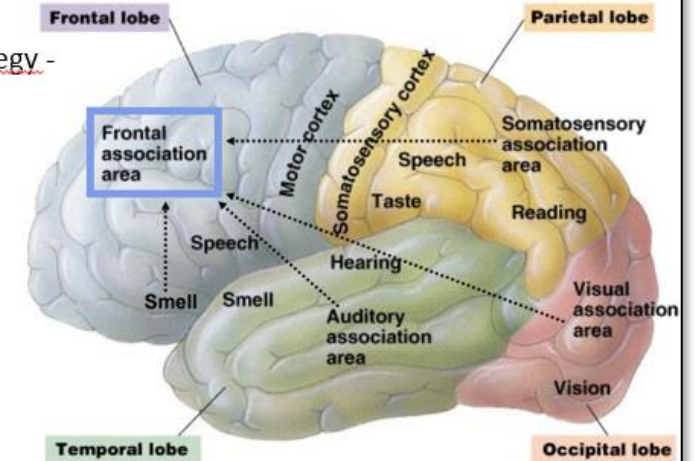
<http://www.slideshare.net/drpsdeb/presentations>

Analysis  
Categorization

## Frontal association area

Executive functions

- Motor/non-motor planning/organization - strategy - anticipation
- Thinking – mental models processing
- Attention – „information filtering“
- Behavioral control
  - Facilitation of „wanted“
  - Inhibition of „unwanted“



<https://www.slideshare.net/thelawofscience/cns-13256395>

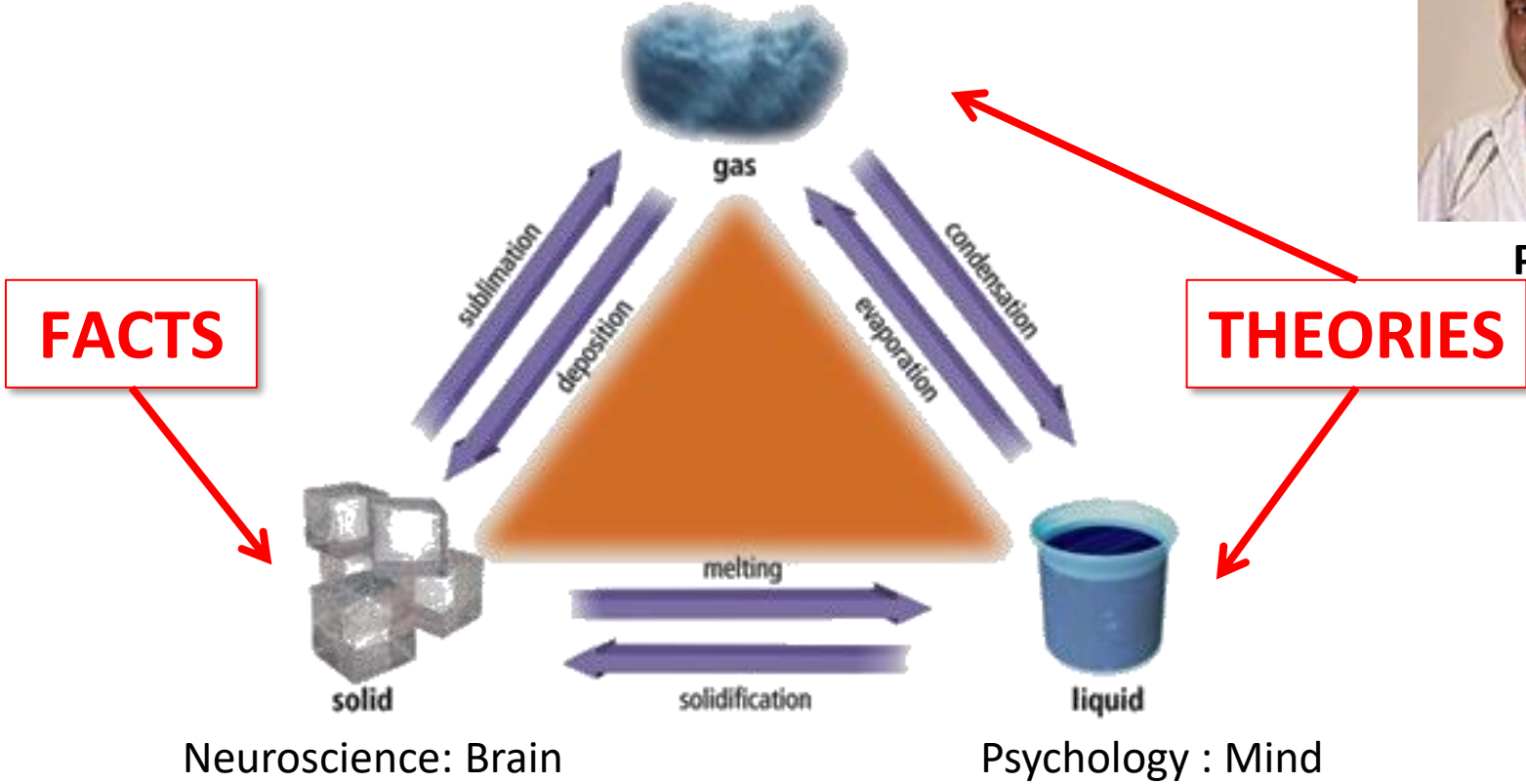
Anticipation  
Expectation

# Three States of Cognition

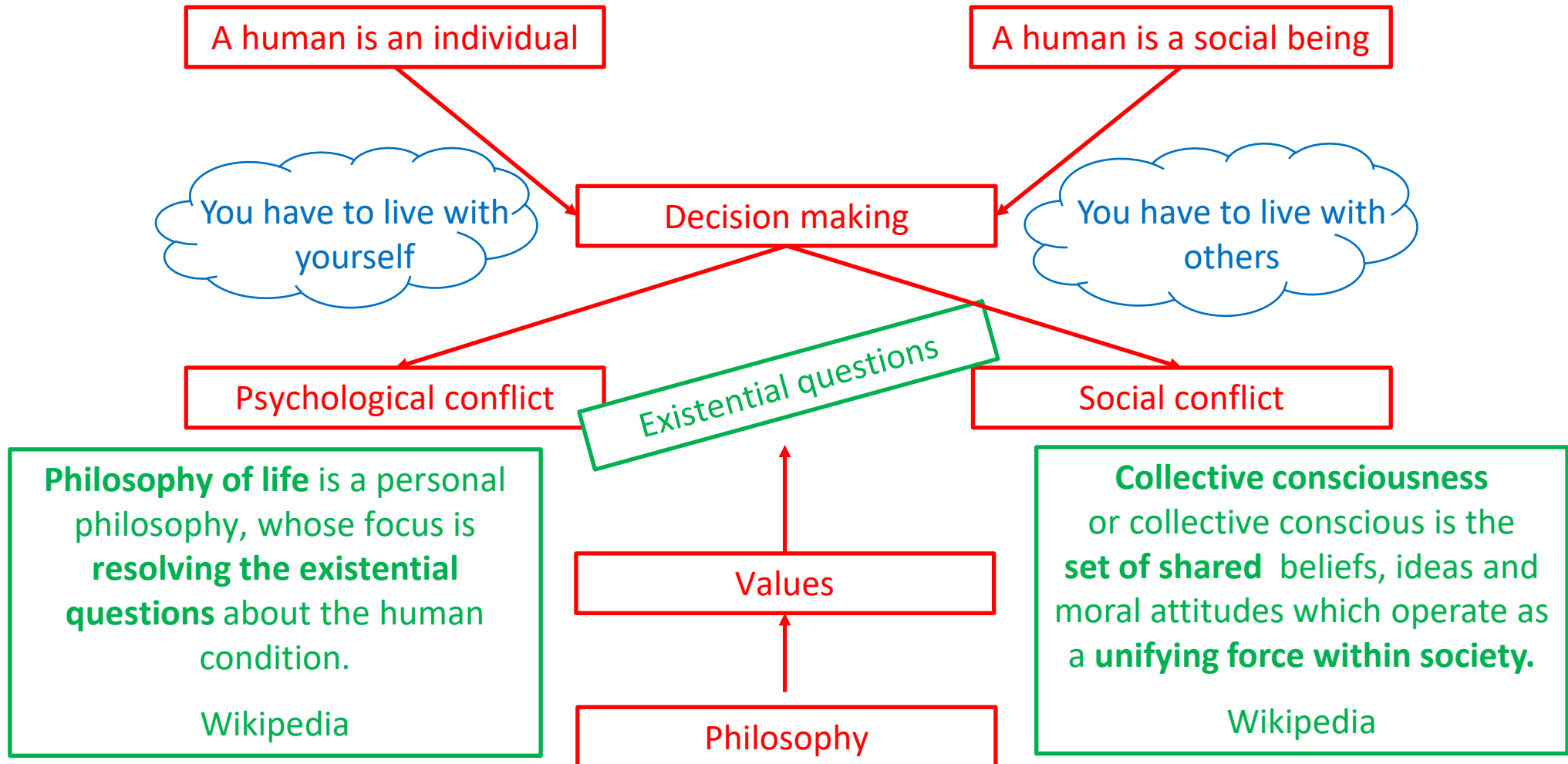
Philosophy : Mind behind Mind



PS Deb



# Why?



# Why?

A human is an individual

A human is a social being

You have to live with yourself

You have to die

You have to live with others

Psychological conflict

Existential questions

Social conflict

**Philosophy of life** is a personal philosophy, whose focus is **resolving the existential questions** about the human condition.

Wikipedia

Values

**Collective consciousness** or collective conscious is the **set of shared** beliefs, ideas and moral attitudes which operate as a **unifying force within society**.

Wikipedia

Philosophy

# Jan Sokol

<http://www.jansokol.cz/2014/03/civilizace-kultura-a-nabozenstvi/>

## Three levels of life in society

Civilization level

- Everyday activities, user
- „Manual“ is sufficient, imitation



# Jan Sokol

<http://www.jansokol.cz/2014/03/civilizace-kultura-a-nabozenstvi/>

## Three levels of life in society

### Civilization level

- Everyday activities, user
- „Manual“ is sufficient, imitation

### Cultural level

- Creativity
- Knowledge and technique are needed

# Jan Sokol

<http://www.jansokol.cz/2014/03/civilizace-kultura-a-nabozenstvi/>

## Three levels of life in society

### Civilization level

- Everyday activities, user
- „Manual“ is sufficient, imitation

### Cultural level

- Creativity
- Knowledge and technique are needed

### Religious level

- Inspiration of creativity
- Awareness of meaning is needed

# Jan Sokol

<http://www.jansokol.cz/2014/03/civilizace-kultura-a-nabozenstvi/>

## Three levels of life in society



- Inspiration of creativity
- Awareness of meaning is needed

# Culture

– the sum of knowledge

- ✓ Material
- ✓ Spiritual



<https://cdn.nexternal.com/tjb/images/FC-11.jpg>



<https://s-media-cache-ak0.pinimg.com/564x/9a/86/da/9a86da32052973bb085dc1511d4b7102.jpg>



<http://previews.123rf.com/images/dja65/dja651107/dja65110700341/10025966-Stone-age-axe-Stock-Photo-tools-ancient-stone.jpg>



[http://www.thebushcraftstore.co.uk/ekmps/shops/bduimportsitd/images/condor-greenland-pattern-axe-\[2\]-12105-p.jpg](http://www.thebushcraftstore.co.uk/ekmps/shops/bduimportsitd/images/condor-greenland-pattern-axe-[2]-12105-p.jpg)



<https://en.wikipedia.org/wiki/File:Mary16thC.jpg>



<https://www.wikiart.org/en/leonardo-da-vinci/the-madonna-of-the-carnation>



<https://pixels.com/featured/1-madonna-and-child-peter-paul-rubens.html>

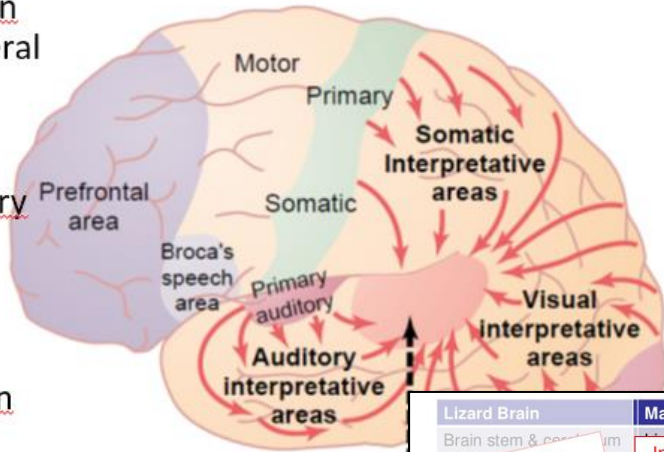


<https://www.wikiart.org/en/m-h-maxy/madonna>

# Complementary ways of thinking

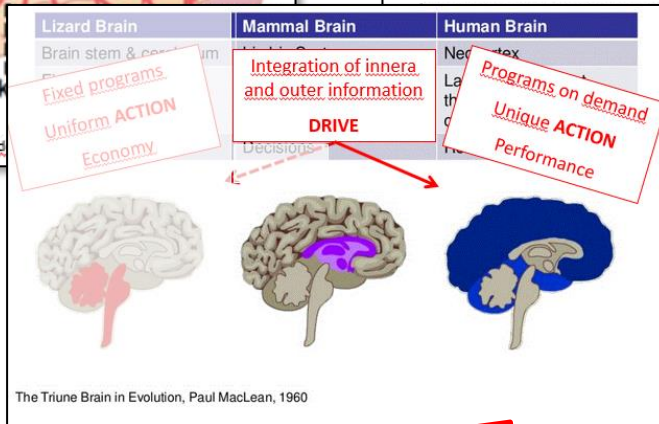
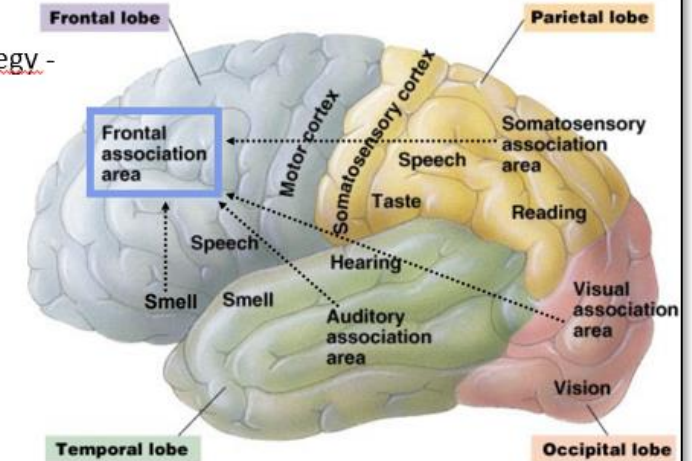
## Parieto-occipito-temporal association area

- Linking and interpretation of information from several sensory modalities
- Visual – acoustic – sensory analysis
- Object recognition and categorization
- Language comprehension
- Attention



## Frontal association area

- Motor/non-motor planning/organization - strategy - anticipation
- Thinking – mental models processing
- Attention – „information filtering“



**Analysis  
Categorization**

**Anticipation  
Expectation**

**Drive**

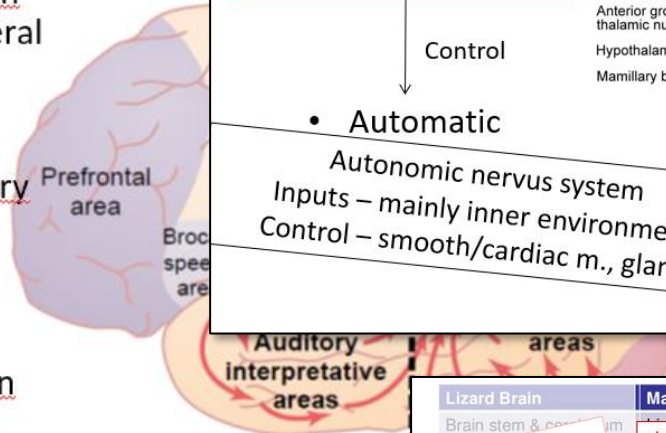


# Comp

# inking

## Parieto-occipito-tempora

- Linking and interpretation of information from several sensory modalities
- Visual – acoustic – sensory analysis
- Object recognition and categorization
- Language comprehension
- Attention



## Concept of the limbic system

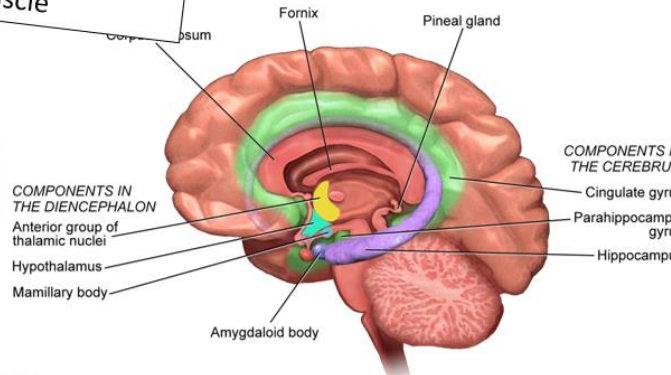
Somatic nervous system  
Inputs – mainly from outer environment  
Control – skeletal muscle

- Voluntary

### Limbic system

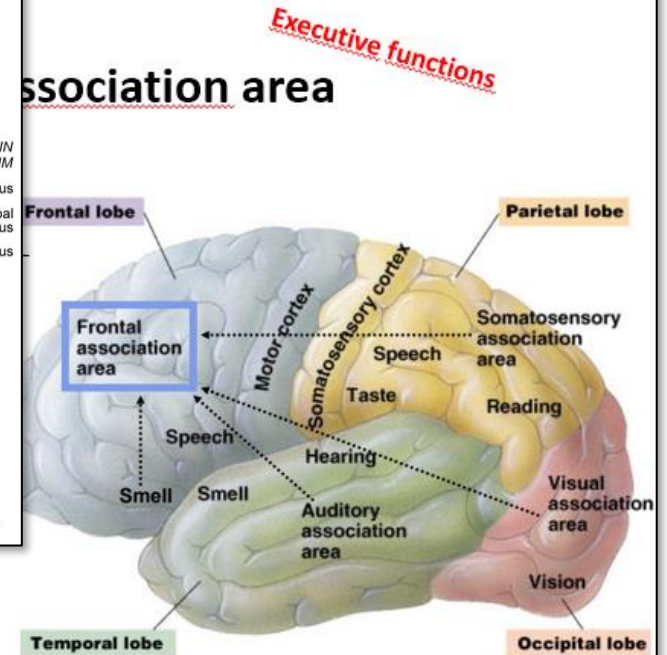
Autonomic nervous system  
Inputs – mainly inner environment  
Control – smooth/cardiac m., glands

- Automatic

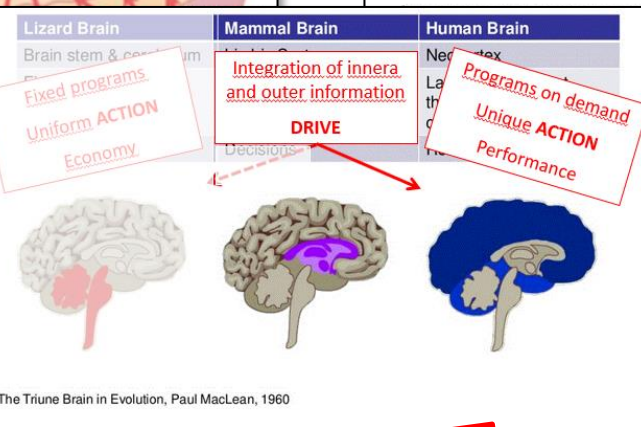


[https://upload.wikimedia.org/wikipedia/commons/d/d1/Blausen\\_0614\\_LimbicSystem.png](https://upload.wikimedia.org/wikipedia/commons/d/d1/Blausen_0614_LimbicSystem.png)

## Association area



<https://www.slideshare.net/thelawofscience/cns-13256395>



The Triune Brain in Evolution, Paul MacLean, 1960

Analysis  
Categorization

Anticipation  
Expectation

Drive

# Limbic system and neocortex

## Instinctive behavior

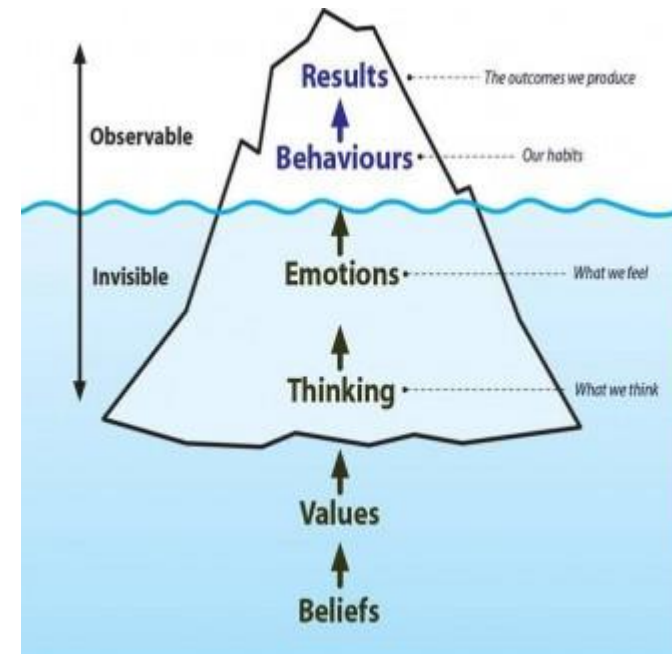
- Limbic system
- ✓ I see a nice thing, so why not to steal it?

## Socially enforced behavior

- Legal behavior
- Neocortex – limbic system
- ✓ Theft is a crime, and punishment may come

## Moral behavior

- Legitimate behavior
- Limbic system
- ✓ Stealing is a bad thing



<http://www.coaching.net.nz/wp-content/uploads/2013/06/iceberg-for-blog-from-j-e1371521135440.jpg>

# Limbic system and neocortex

## Instinctive behavior

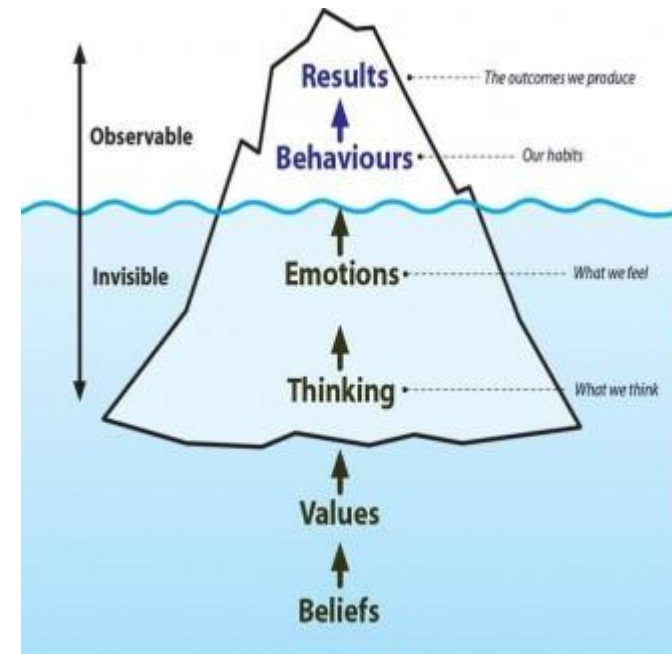
- Limbic system
- ✓ I see a nice thing, so why not to steal it?

## Socially enforced behavior

- Legal behavior
- **Fear of punishment** (Limbic system)
- ✓ Stealing is a crime, and punishment may come

## Moral behavior

- Legal behavior
- **Moral stance** (Neocortex)
- ✓ Stealing is a bad thing

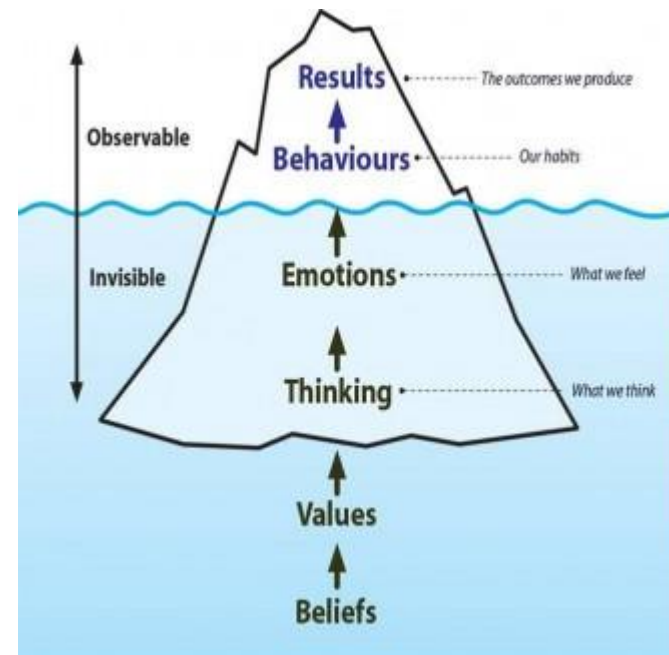


<http://www.coaching.net.nz/wp-content/uploads/2013/06/iceberg-for-blog-from-j-e1371521135440.jpg>



# Limbic system and neocortex

**Information**  
NEOCORTEX  
VS  
**Complex information**  
NEOCORTEX/limbic system  
VS  
**Values/Philosophy/Faith**  
Neocortex/LIMBIC SYSTEM



<http://www.coaching.net.nz/wp-content/uploads/2013/06/iceberg-for-blog-from-j-e1371521135440.jpg>

# Cognitive maps

Type of **mental representation** which serves an individual to acquire, code, store, recall, and decode information about the **relative locations and attributes** of phenomena in their everyday or metaphorical spatial environment.

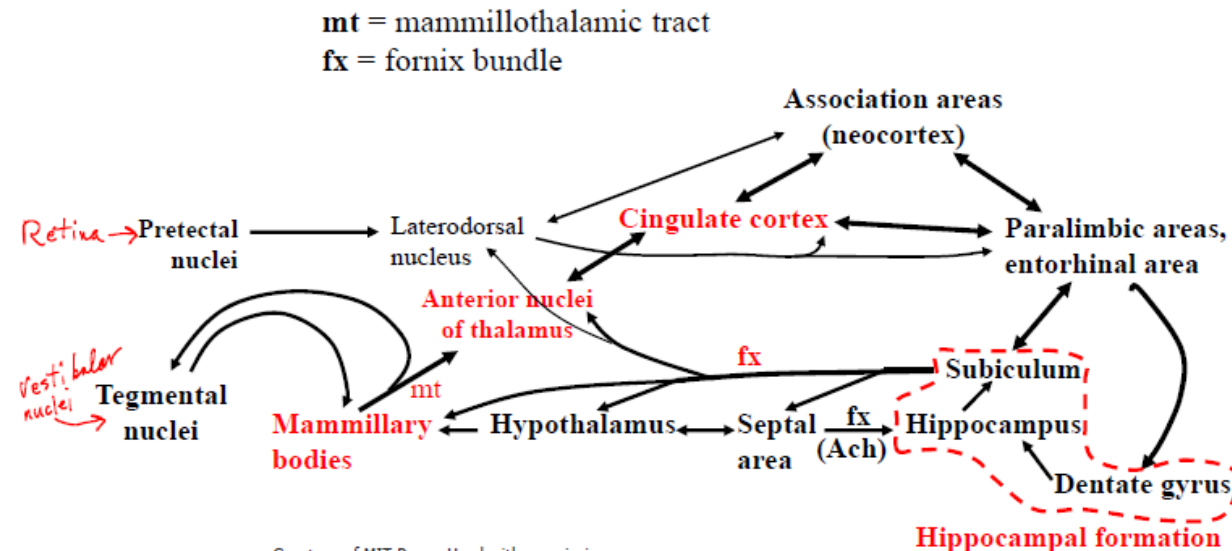
Wikipedia

- Origins of endbrain: Structures underlying olfaction
- Two major links between olfactory system and the motor systems of the midbrain

✓ Object oriented  
✓ Implicite

✓ Location oriented  
✓ Explicite

- 1) Through the ventral endbrain, which became corpus striatum and basal forebrain (including much of the septal area)
  - Outputs to hypothalamus, (epithalamus, subthalamus), midbrain
  - These outputs affected locomotion and orienting movements
  - The links were plastic, so habits were formed according to rewarding effects mediated, e.g., by taste effects.
- 2) Through the medial part of the dorsal endbrain, which became medial pallium—the hippocampal formation
  - Outputs to ventral striatum, hypothalamus, epithalamus
  - The links were plastic, but the “habits” formed were different: The association of place with good or bad consequences of approach.



Courtesy of MIT Press. Used with permission.  
Schneider, G. E. Brain Structure and its Origins: In the Development and in Evolution of Behavior and the Mind. MIT Press, 2014. ISBN: 9780262026734.

http://www.slideshare.net/drsunilsuthar/neurobiology-of-emotion



Prof. Gerald Schneider

MUNI  
MED

# Learning and memory

- Connections of striatum and hippocampus are plastic
- Plasticity is a base of learning
- Learning is a forming of long- term memory
  
- Declarative memory (explicit)
- Based on hippocampus
- Explicit information is stored and later recollected
- „Construction of the maps (relationships)“ – spatial or abstract
  
- Procedural memory (implicit)
- Based on striatum
- Habitual learning – motor skills, but also social habits
- „Construction of the algorithms“

Location oriented:  
Where am I and what  
has happened here?

Object oriented:  
Can I eat it and how  
to eat it?

**Cognitive map  
term definition**

Edward C. Tolman

1948



[https://en.wikipedia.org/wiki/Edward\\_C.\\_Tolman](https://en.wikipedia.org/wiki/Edward_C._Tolman)

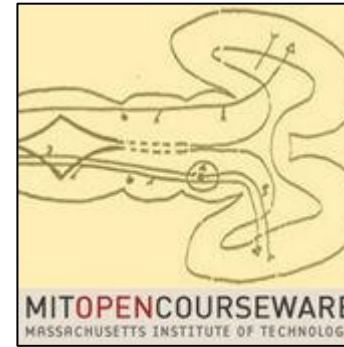
**Anatomical  
correlate?**

Gerald Schneider



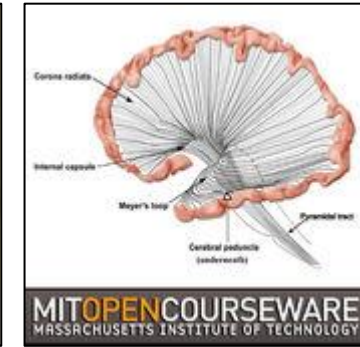
O'Keefe and Nadel  
'70s  
And others

2009

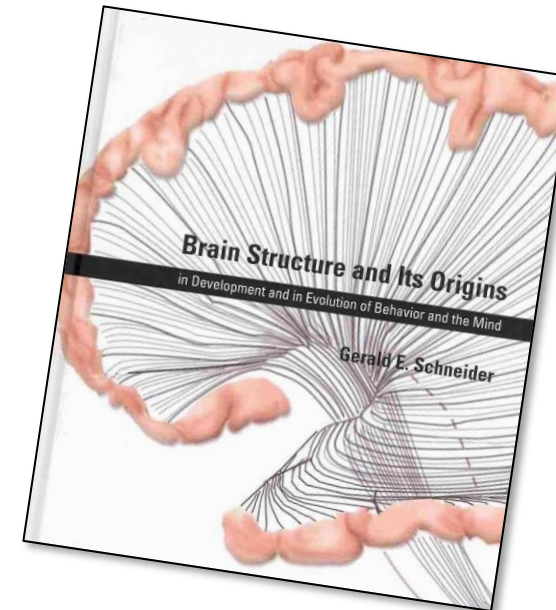


<https://itunes.apple.com/us/podcast/brain-structure-and-its-origins-2009/id385157530?mt=2>

2014



<https://itunes.apple.com/us/podcast/brain-structure-and-its-origins-2014/id944293984?mt=2>



2014

# Cognitive maps

Type of **mental representation** which serves an individual to acquire, code, store, recall, and decode information about the **relative locations and attributes** of phenomena in their everyday or metaphorical spatial environment.

Wikipedia

Later generalized to refer to a kind of **semantic network** **representing** an individual's personal **knowledge or schemas**.

Wikipedia

# Cognitive maps

Type of **mental representation** which serves an individual to acquire, code, store, recall, and decode information about the **relative locations and attributes** of phenomena in their everyday or metaphorical spatial environment.

Wikipedia

- ✓ Complex
- ✓ Unique
- ✓ Egocentric, but multiple points of view

Later generalized to refer to a kind of **semantic network** representing an individual's personal **knowledge or schemas**.

Wikipedia



# Cognitive maps

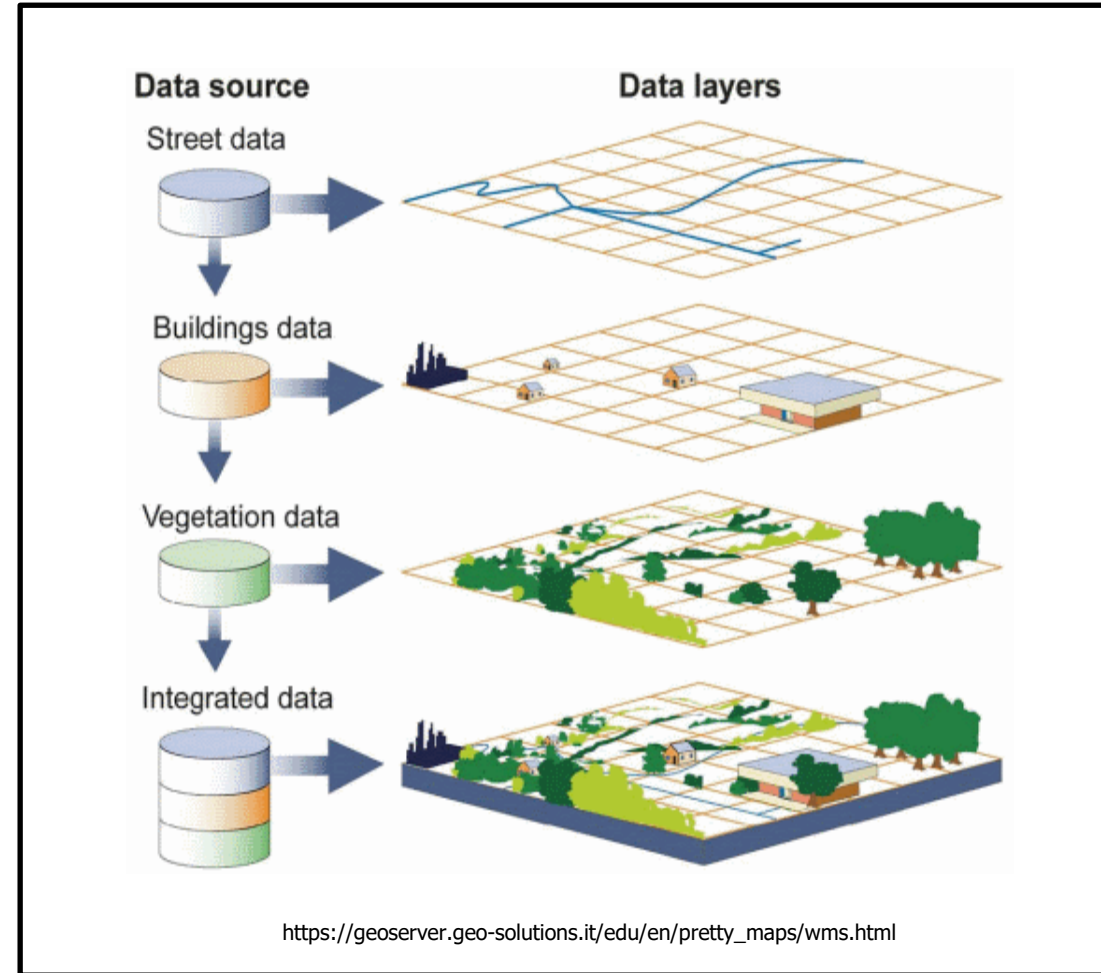
Type of **mental representation** which serves an individual to acquire, code, store, recall, and decode information about the **relative locations and attributes** of phenomena in their everyday or metaphorical spatial environment.

Wikipedia

- ✓ Unique
- ✓ Egocentric, but multiple points of view
- ✓ Complex

Later generalized to refer to a kind of **semantic network** representing an individual's personal **knowledge or schemas**.

Wikipedia



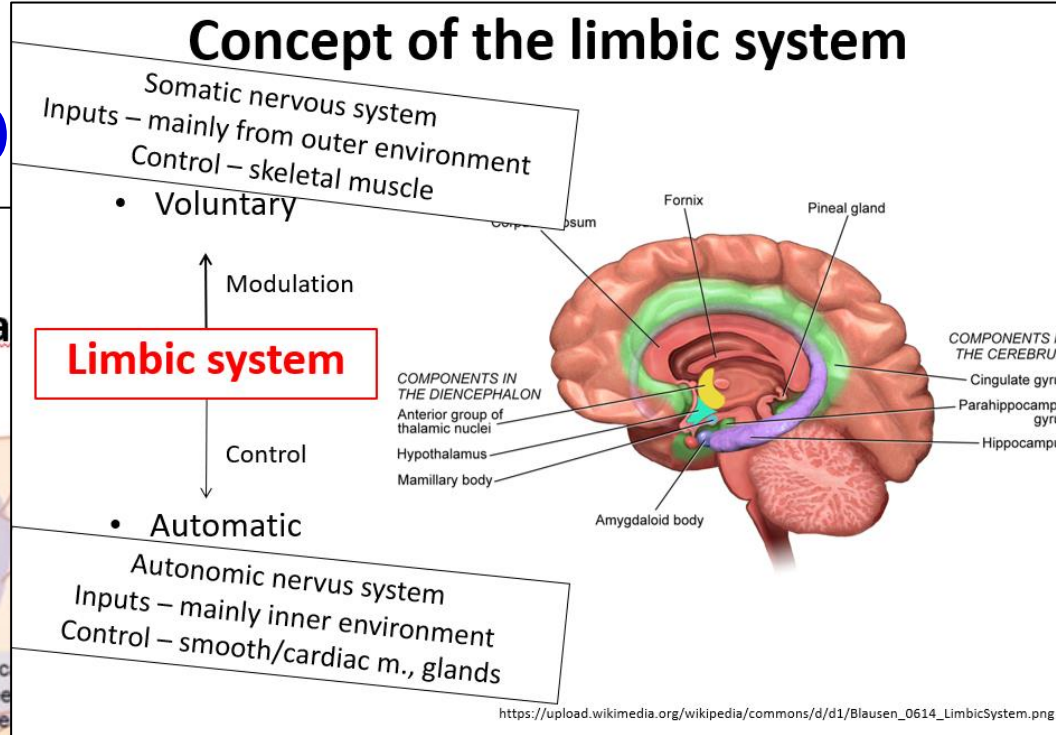
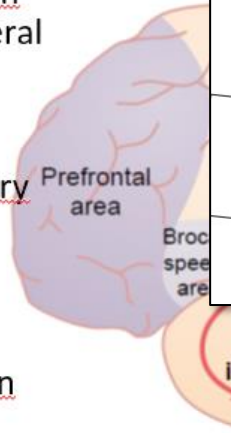


# Comp

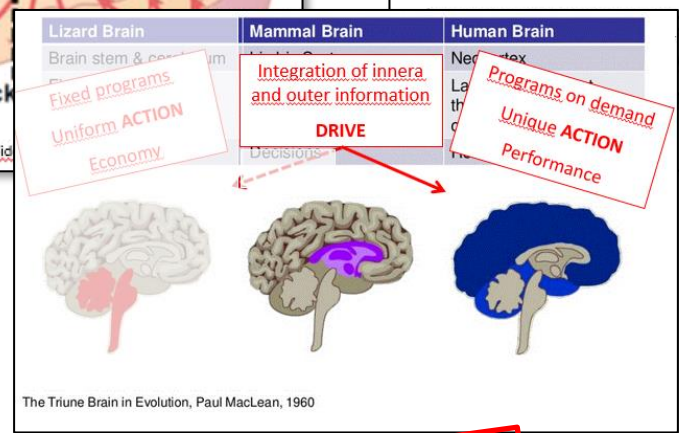
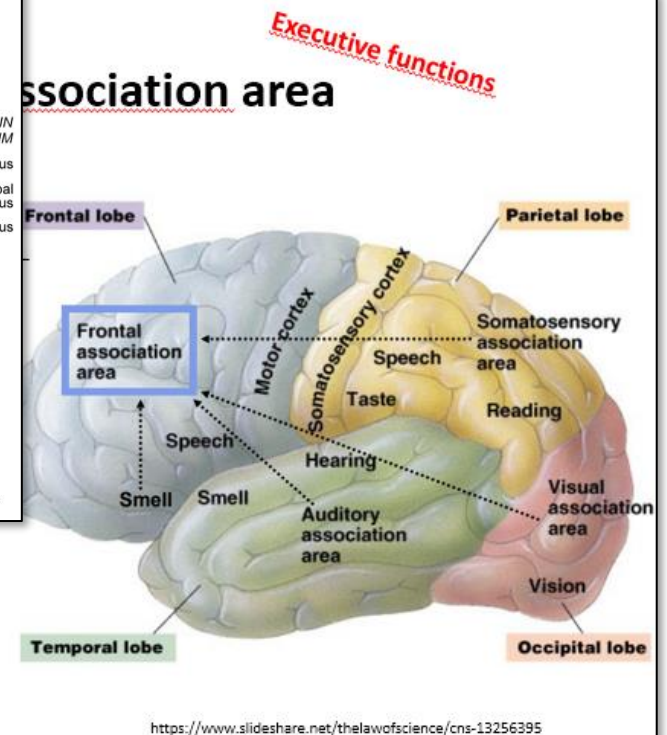
# inking

## Parieto-occipito-tempora

- Linking and interpretation of information from several sensory modalities
- Visual – acoustic – sensory analysis
- Object recognition and categorization
- Language comprehension
- Attention



## Association area



**Analysis  
Categorization**

**Anticipation  
Expectation**

**Drive**

M U N I

M E D