

# Aspects of a Theory of Mind and Society

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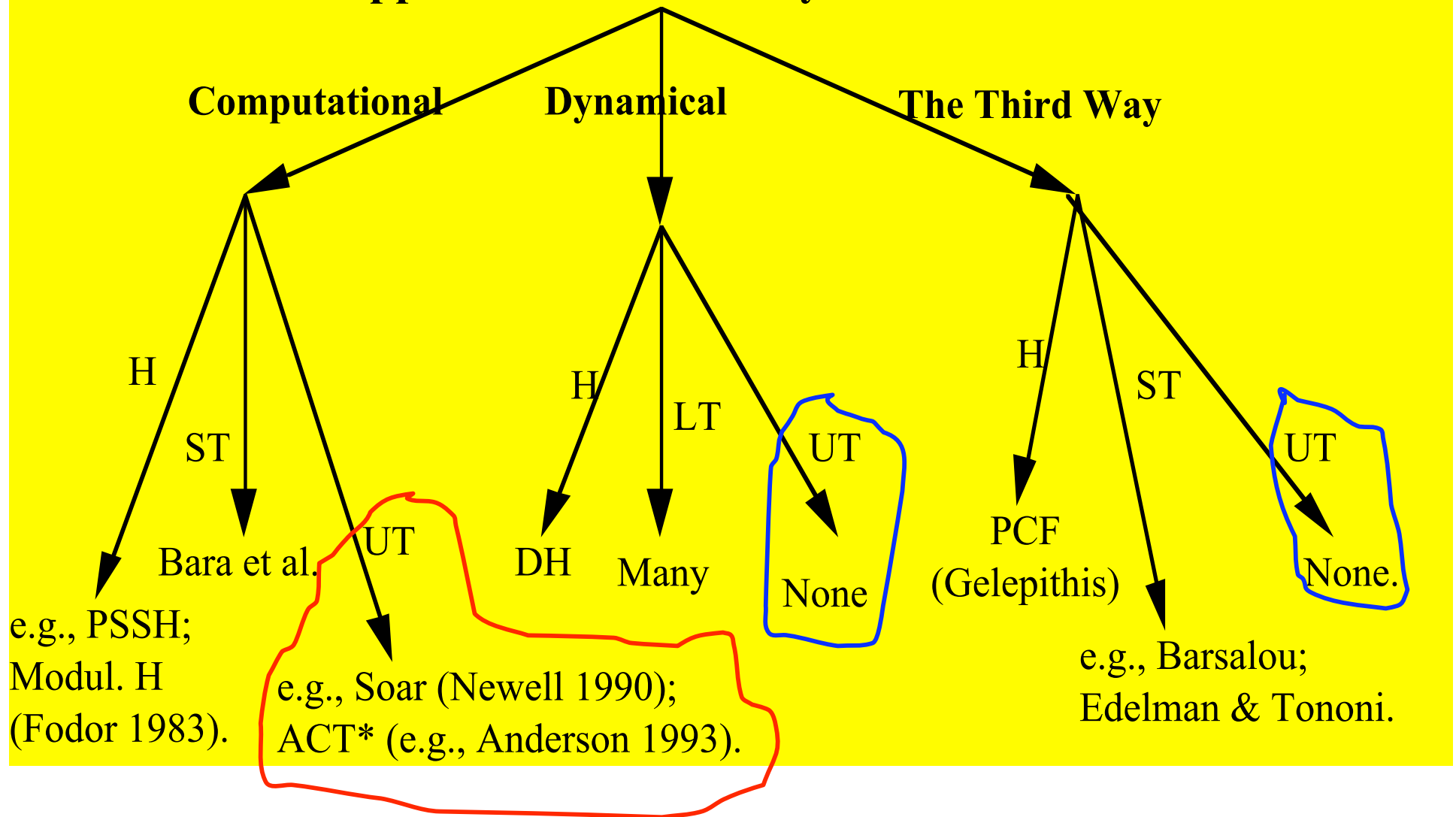
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# Aspects of a ToMaS

1. Approaches to the Study of Mind and Society.
2. A CUP-based theory of Homo Sapiens.
3. Implications.
4. Concluding/opening remarks.

# Approaches to the Study of Mind

(After Gelepithis 2002)

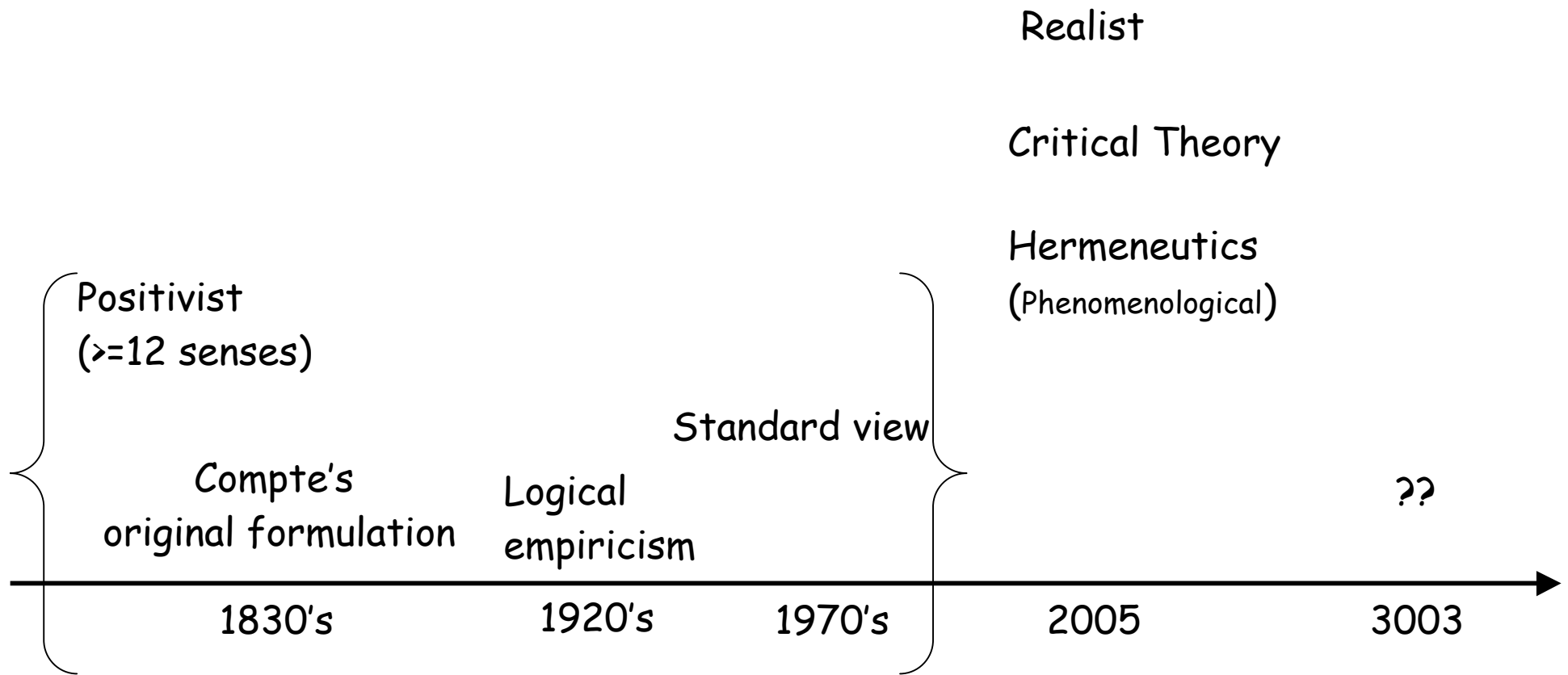


ST= Subject Theory H = Hypothesis

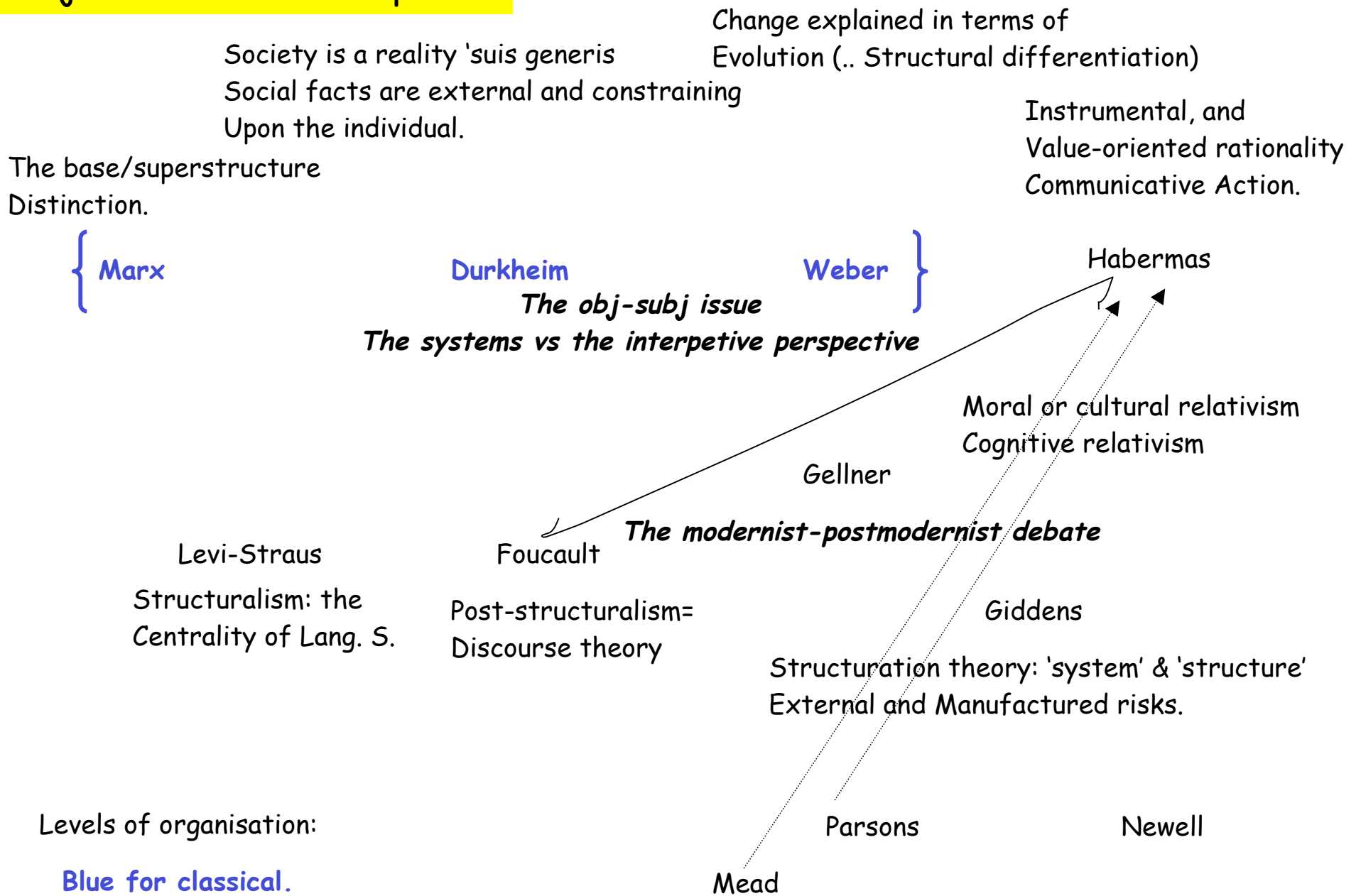
LT= Local Theory DH = Dynamical Hypothesis

UT= Unified Theory PCF = Preliminary Conceptual Framework

# Philosophies of Science and Social Science



# Major thinkers/conceptions



# Foundational notions for a ToM

<i>According to Newell (1990)</i>	<i>According to Gelepithis (1999, 2003)</i>
1. Behaving systems,	1. Perception,
2. Knowledge,	2. Action,
3. <b>Representation</b> ,	3. Growth (e.g., self-organisation),
4. Machine* (e.g., computation),	4. Meaning,
5. Symbol,	5. Thinking (e.g., computation),
6. Architecture,	6. Understanding,
7. <b>Intelligence</b> ,	7. Communication,
8. Search,	8. <b>Representation</b> ,
9. Preparation vs. deliberation*.	9. <b>Intelligent system</b> ,
	10. Purpose,
	11. Emotion,
	12. Human language,
	13. Consciousness,
	14. Beauty.

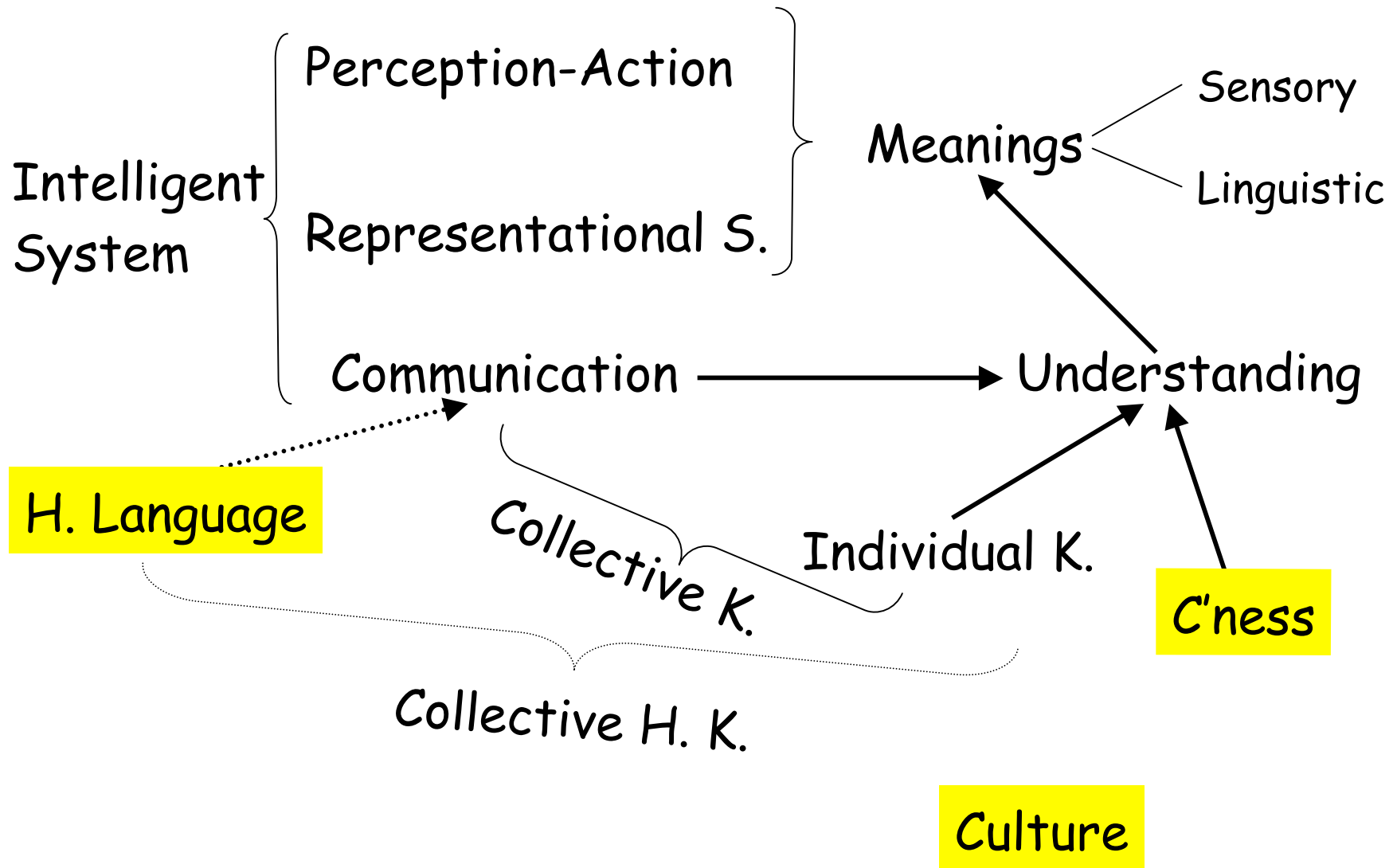
Derived notions:  
Knowledge,  
Symbol.

15. Culture,  
16. Ethical principles

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# Nexus of Foundational notions



# Necessary and sufficient conditions for the mental

A system,  $S$ , is **noemonon** if and only if:

- a) It possesses sensors.
- b) It is able to act on its environment.
- c) It possesses its *own* **representational** system  $R_s$ , i.e.,  $R_s$  is independent of the language of another kind of system  $S^*$ .
- d) It is able to connect sensory, representational, and motor information.
- e) It is able to **communicate** with other systems within its *own* class.

**Noemonon**:=has developed a mind.

# Definition of a Representational System

- $R_e$  is a representational system of  $E$  if and only if  $R_e$  is a **Thought System** of  $E$  able to create **Representations**.

# Definition of Representation

- For an entity  $E$ , a representation of a situation, say,  $S_1$  is another situation, say,  $S_2$ , characterised by the properties:
  - $S_2$  simplifies  $S_1$ ; and
  - $S_2$  preserves the essential characteristics of  $S_1$ .

# Definition of Thought System

$\mathcal{T}$  is a thought system of  $E$

if and only if

$\mathcal{T}$  is a system of thoughts of entity  $E$ .

# Definition of Thought

$\sigma$  is a thought of  $E$

if and only if

$\sigma$  is an ordered  $n$ -tuple of meanings of  $E$ .

# Definition of Meaning

The meaning,  $M$ ,  
of something  $s$ ,  
in the context  $C_s$ ,  
for the entity  $E$ ,  
at time  $t$  } symbol  $M (s, C_s, E, t)$

is the *prevailed* formations of  $R^m_E$ , at  $t$ .

(Gelepithis, 1989)



# Definition of the-end-result-of Understanding

An entity  $E$  has understood something,  $S$ ,

if and only if,

$E$  can present  $S$  in terms of a system of own  
primitives.

( $\pi$  is a primitive iff  $E$ 's understanding of  $\pi$  is immediate).

Remark:  $\therefore$  qualia are primitives.

# Justification of key definitions

➤ Communication.

➤ Understanding.

➤ Meaning (Gelepithis 1988).

# Communication

## Justification:

1. Captures the 2 characteristics of communication (meaning and/or understanding) that, singularly or jointly, cut across all of its conceptions.
2. Clarifies the nature of communication.
3. It is applicable across the full range of animals and machines,.
4. It is rich enough to be used as an explanatory theoretical term in disciplines like **Cybernetics**, **Cognitive Science**, **Sociology** and **Political Science**.
5. Combines the subjective-objective nature of Homo Sapiens.

## Literature characteristics:

1. Extremely multidisciplinary but **not interdisciplinary**.
2. Fragmentary and inadequate to address the scope and significance of the phenomenon of communication.
3. Communication is primarily used as an **orienting term** rather than as an **explanatory theoretical tool**.
4. *Nature* of communication was never pinned down in a convincing and generally accepted way.

# Potential objection

(to its use as explanatory theoretical term)

- 'Communication', as opposed to gravity, is a socially constructed notion rather than an objective reality and, therefore, any attempt to provide an objective account of it is doomed to failure.

# Counter argument

- Both 'gravity' and 'communication' are humanly constructed concepts and both refer to some external phenomena. Their only difference is that 'gravity' has a generally accepted meaning within the Earth-based physicists, whereas 'communication' does not have one within the community of scientists using this notion.

# Definitional characteristics of Human Understanding

1. Human understanding always involves the grasp of human meaning.
2. Human understanding is a **process** that takes place in human brains.
3. Human understanding is required to be terminated.
4. At the end of the process a presentation in terms of a human's own primitives must be possible.

## Justification of Definition:

It meets pinpointed inadequacies:

- provides necessary conditions for U.
- says what U is.
- it is in accordance with established linguistic conditions.

It satisfies the positive contributions of the propositional approach, because:

- Context, motivation, and principles are part of a system of primitives.
- The essence of the semasiosyntactic approach is accounted for as our definition implies the existence of a sequence of steps.

It satisfies our feeling for HU as a fundamental mental process.

It does not violate the common sense of U as described by most dictionaries and encyclopaediae.

It does not contradict major philosophical positions on HU.

*A To Ma S, October 2004, Univ. of Shizuoka,*

## Conceptions of Human Understanding

(Gelepithis 1986)

Nature (Schools and Individuals)	Main advantage	Main disadvantage
<p><i>Semasiosyntactic:</i></p> <p>To understand a sentence in a language it is adequate to understand the meanings of the words comprising the sentence and know the grammatical rules of that language</p>	<p>Formalistic nature (applicability).</p>	<p>Inadequate requirements. Silent on the nature of understanding.</p>
<p><b>P</b> <b>R</b> <b>O</b> <b>P</b> <b>O</b> <b>S</b> <b>I</b> <b>T</b> <b>I</b> <b>O</b> <b>N</b> <b>A</b> <b>L</b></p> <p><i>Contextual:</i></p> <p>Semasiosyntactic requirements plus the context in which a sentence occurs.</p>	<p>Showed inadequacy of the semasiosyntactic approach.</p>	<p>As above</p>
<p><i>Motivational:</i></p> <p>Contextual requirements plus knowledge of the motivation behind the utterance of of a sentence.</p>	<p>Showed inadequacy of the contextual approach.</p>	<p>As above (eg intention is lacking).</p>
<p>Pask's work/view.</p>	<p>Powerful conceptual analysis.</p>	<p>Set of conditions given for understanding incomplete.</p>
<p>Ziff's work/view.</p>	<p>Cleared several misconceptions in the study of understanding.</p>	<p>Too general to be useful.</p>
<p><b>H</b> <b>E</b> <b>R</b> <b>M</b> <b>E</b> <b>N</b> <b>E</b> <b>U</b> <b>T</b> <b>I</b> <b>C</b></p> <p><i>Majority of cases:</i></p> <p>Understanding is seen as a primitive notion or, possibly, as a methodological tool (see, Ricoeur, Dilthey).</p>	<p>Ascribes to understanding its much needed significance.</p>	<p>Unnecessarily imprecise.</p>
<p><i>Moravcsik:</i></p> <p>Understanding is seen as that state of mind which yields the insight that unites one's knowledge required to arrive at the solution to a problem.</p>	<p>Understanding describable in terms of knowledge. Partly successful criticism of the analytic school.</p>	<p>Against established linguistic conventions. Introduction of terms less clear than understanding itself eg, insight.</p>

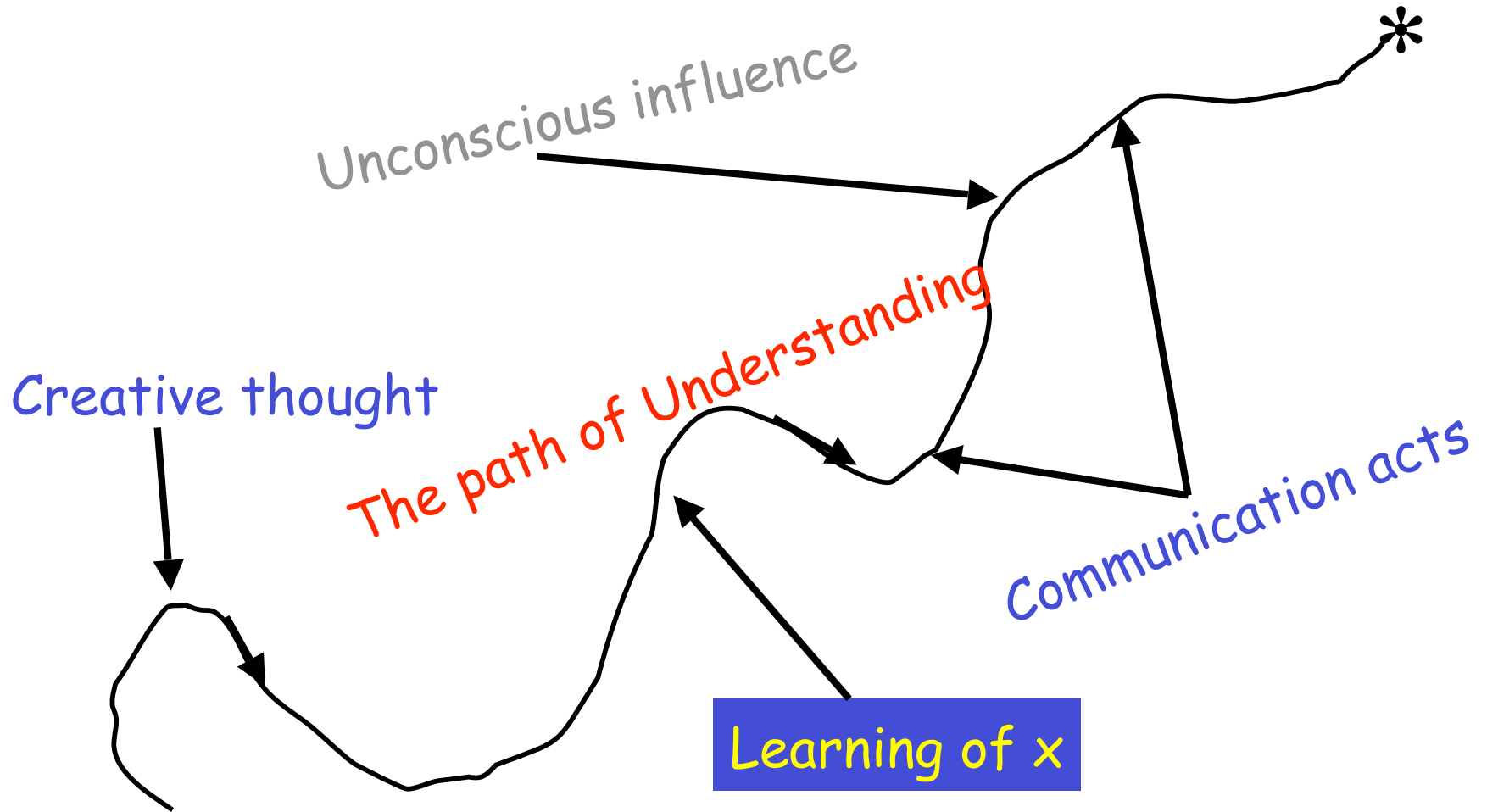
# The Communication-Understanding Principle

The processes of Communication and Understanding are the central processes shaping the structure of the Mind of an Intelligent Entity (animal, machine, or extraterrestrial).

# Definition of Individual Knowledge

Knowledge of entity  $E$  at time  $t$  is *the system of understandings* that  $E$  has reached by that time.

# Aspects of the Process of Understanding



# Maths to illustrate complexity

①  $K_{E,t} = U_{E,t}$  (i.e., the *system* of understandings of E at time t).

$$\textcircled{2} U_{E,t} = \otimes_{s \in S} U_{E,t}(s).$$

③  $U_{E,t}(s) = \prod_{E,t}$  (i.e., the *system* of primitives of E at time t).

$$\textcircled{4} \prod_{E,t} = \otimes \pi_i, C_j$$

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# Implication-1 (Gelepithis 1991)

Granting the feasibility of the strong  
engineering AI objective,

Human-Robotic Communication  
is, in principle, impossible.

## Implication-2 (Gelepithis 2005)

In contrast to an Information Market,

Knowledge Market is not realisable.

# Implication-3 (Philosophy of Social Science)

## Collapse of the objective-subjective divide

Statements about human affairs  
cannot be factually True or False (e.g., Weber)

Value-free and unbiased social science  
is possible (e.g., Nagel)

Value-laden statements about human affairs  
can be agreed by human communities to an extent  
equal to statements about physical affairs.

Rate of change of the phenomena under investigation  
differs between physical and social disciplines.

## Implication-4 (Philosophy of Science)

The four basic conceptions of truth: intrinsic, correspondence, coherence, and consensus are aspects of any human knowledge system.

## 'Implication'-5 (Political philosophy)

How society should be organised?

The development of critical thinking should become the fundamental objective of education.

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# Theories of Society

**VS**

# Social Problems

# Crucial issues in the 21st century

- Threats to the environment.
- Poverty.
- Risks due to R&D.
- Dangers from nuclear proliferation.
- Economic Globalisation.
- ICT globalisation.
- Shift in population change.
- Shift in power relations.
- Consumerism.

**Why Human Society does not try to:**

**Move from local, regional cultures**

**To**

**Earthian civilisation?**