

Thinking

Cato A Bjørkli
Psychologist

Aim of this lecture

Make a comparison between language and thinking

Know basic structure of thinking

Know basic dynamics of thinking

Know limitations with the presented models of thinking

Ask good questions.

Thinking 05 04 05 Cato A Bjørkli

Background for this lecture

Passer & Smith (2004) p.289-300

Teigen (2004) div

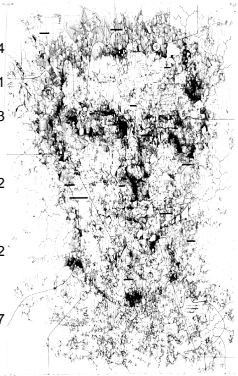
Div

Thinking 05 04 05 Cato A Bjørkli

Thinking : What is it?

Thinking 05 04 05 Cato A. Bjørkli

1872
1888
1894
1911
1913
1925
1942
1948
1952
1956
1957
1959

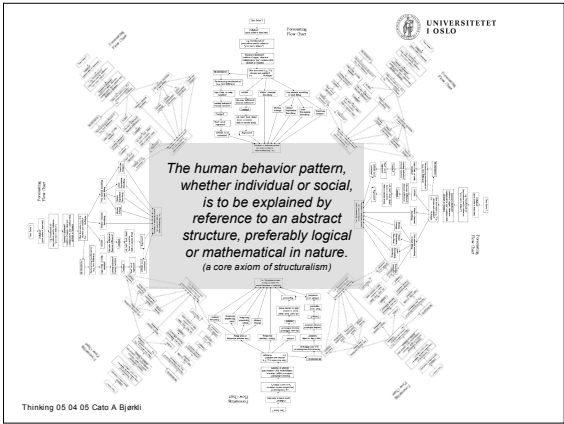


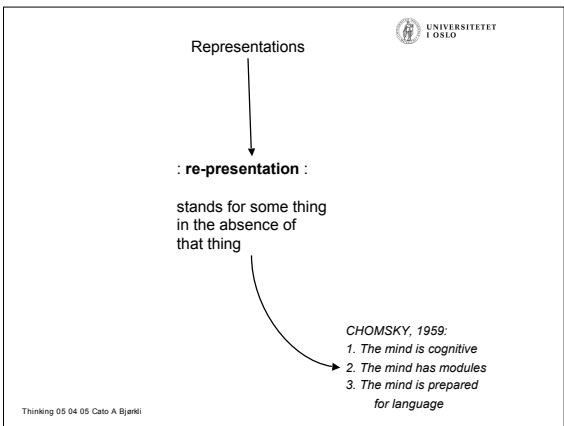
Thinking 05 04 05 Cato A. Bjørkli

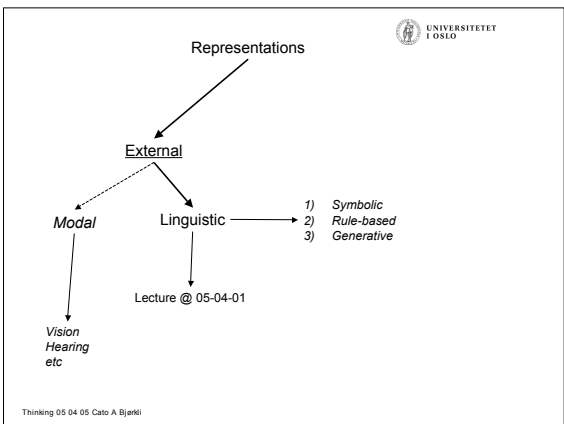
Core features of cognitive science

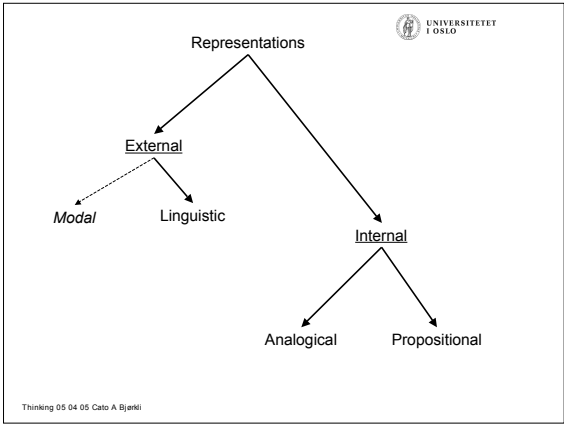
- Representations
- Computers
- Downplay of culture, affect, context
- Interdisciplinary studies
- Philosophical Issues

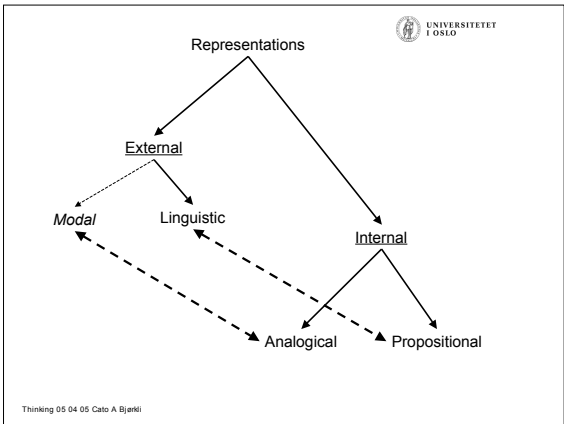
Thinking 05 04 05 Cato A. Bjørkli

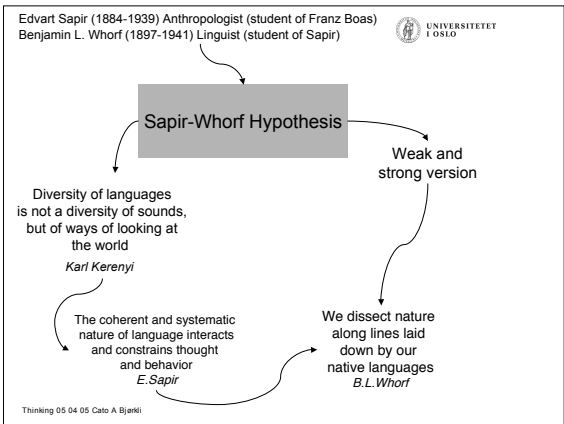




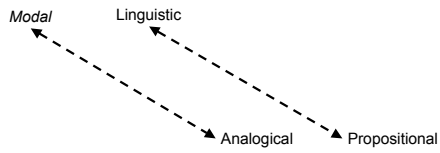








Think of something that cannot be said.
Think of something that has no concept.
Think of nothing.



Thinking 05 04 05 Cato A. Bjørkli

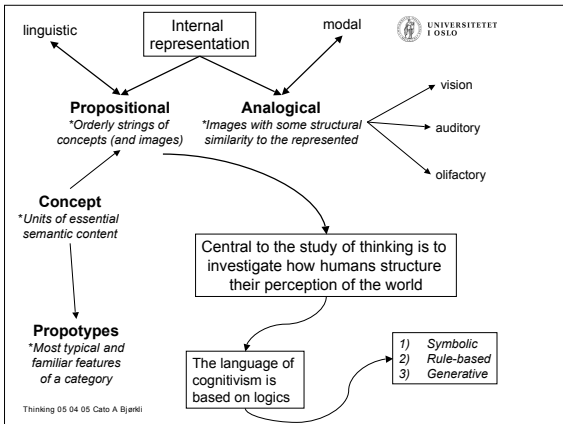
*Thinking may be considered the internal language
of the mind ,-*

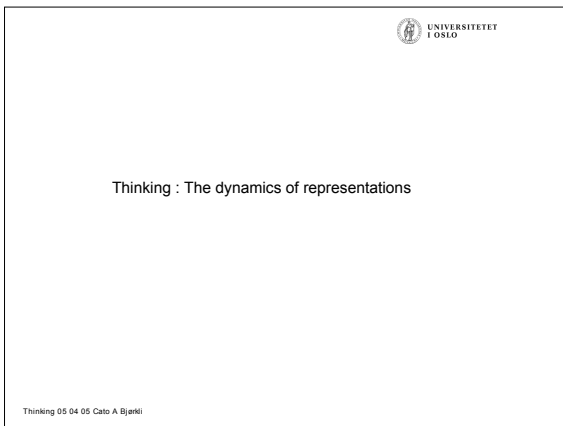
Passer & Smith (2004) p.289

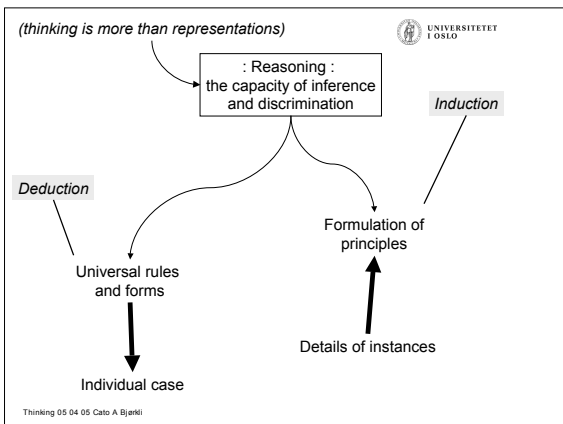
Thinking 05 04 05 Cato A. Bjørkli

Thinking : Basic structure and content

Thinking 05 04 05 Cato A. Bjørkli







UNIVERSITETET
I OSLO

"Information is not a scarce resource. Attention is."
Herbert Simon, 1981

Thinking 05 04 05 Cato A. Bjørkli

UNIVERSITETET
I OSLO

Remember the core axioms of structuralism!

Reasoning in the forms of deduction and induction is clearly based in logics

"The chance of success is 50%" or "The chance of failure is 50%"
Kahneman & Tversky, 1979

The two propositional statements are logically equivalent, yet, people respond differently. Why?

Human reasoning is not exclusively logical

bias

distraction

How would a computer respond?

Thinking 05 04 05 Cato A. Bjørkli

UNIVERSITETET
I OSLO

"Information is not a scarce resource. Attention is."
Herbert Simon, 1981

"Given the enormous amount of stuff, and some task to be done using some of the stuff... What is the relevant stuff for the task?" Glymour, 1987

Observability is more than mere data availability.
Woods et al, 2002

Humans are not logic machines

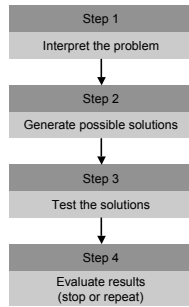
Thinking 05 04 05 Cato A. Bjørkli

Thinking Beyond Logics: Steps in Problem Solving

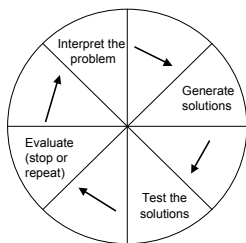
Thinking 05 04 05 Cato A. Bjørkli

Note: Despite the inadequacy of logics, the idea of structuralism is not necessarily untrue or useless.

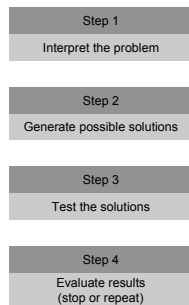
We need to find a description of thinking includes our irrational whims and incredible flexibility



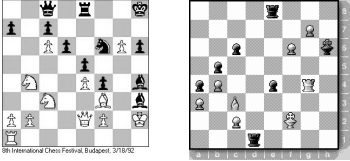
Thinking 05 04 05 Cato A. Bjørkli



Thinking 05 04 05 Cato A. Bjørkli



Page Zulu (2005) v. Sidle (18/02)




UNIVERSITETET I OSLO

1.e4 e5 2.Nf3 Nc6 3.Bb5 a6 4.Ba4 Nf6 5.O-O Be7 6.Re1 b5
7.Bb3 d6 8.c3 O-O 9.h3 h6 10.d4 Re8 11.Nbd2 Bf8 12.Nf1
Bd7 13.Ng3 Na5 14.Bc2 c5 15.b3 Nc6 16.d5 Ne7 17.Be3
Ng6 18.Qd2 Nh7 19.a4 Nh4 20.Nxh4 Qxh4 21.Qe2 Qd8
22.b4 Qc7 23.Rec1 c4 24.Ra3 Rec8 25.Rca1 Qd8 26.f4 Nf6
27.fxe5 dxe5 28.Qf1 Ne8 29.Qf2 Nd6 30.Bb6 Qe8 31.R3a2
Be7 32.Bc5 Bf8 33.Nf5 Bxf5 34.exf5 f6 35.Bxd6 Bxd6
36.axb5 axb5 37.Be4 Rxa2 38.Qxa2 Qd7 39.Qa7 Rc7
40.Qb6 Rb7 41.Ra8+ Kf7 42.Qa6 Qc7 43.Qc6 Qb6+
44.Kf1 Rb8 45.Ra6 1-0

Thinking 05 04 05 Cato A. Bjørkli

UNIVERSITETET I OSLO

Kasparov comments the loss to Deep Blue over five matches in 1997



MOSCOW (CNN) — In Moscow, where chess is serious business, Garry Kasparov's chess match against Deep Blue is not just another board game. It's a man vs. machine epic, with profound implications for the species

Thinking 05 04 05 Cato A. Bjørkli

Structures of Problem Solving

UNIVERSITETET I OSLO

Affecting our generation of solutions

Problem Solving Schemas

Algorithms
*detailed formulas

Heuristics
*rules of thumb

Sub-Goal Means End

Thinking 05 04 05 Cato A. Bjørkli

UNIVERSITETET
I OSLO

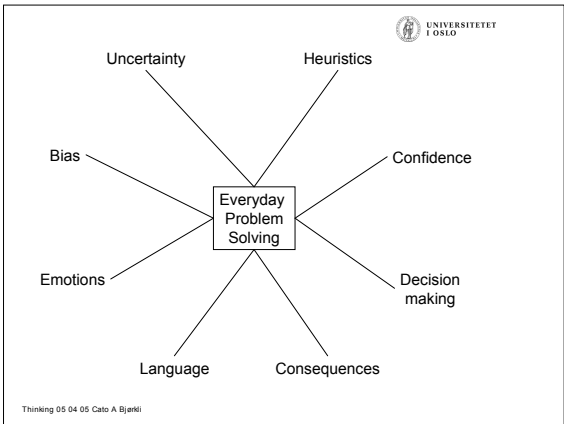
The human behavior pattern, whether individual or social, is to be explained by reference to an abstract structure, preferably logical or mathematical in nature.
(a core axiom of structuralism)

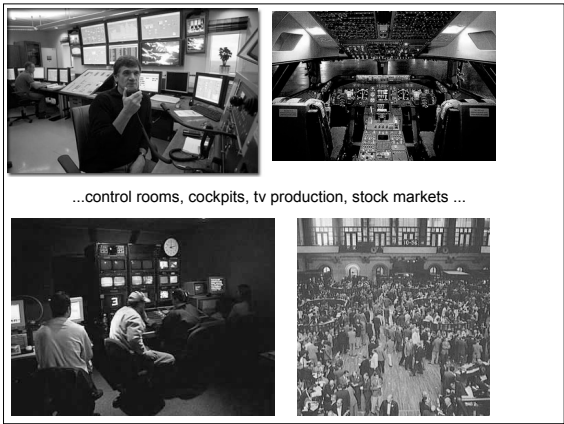
Computation over representations in the common code is what thinking is
- Jerry Fodor

von Neumann' Principles

- 1) Computing abstract symbolic representations
- 2) Computations is governed by a stored program of rules
- 3) Processing is coordinated with memory

Thinking 05 04 05 Cato A. Bjørkli



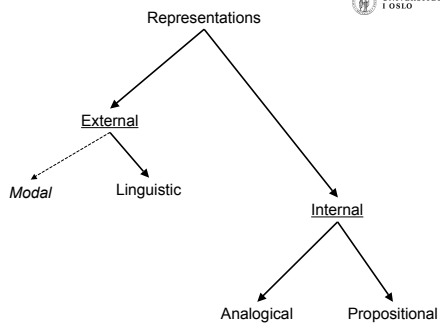


Taking one step back

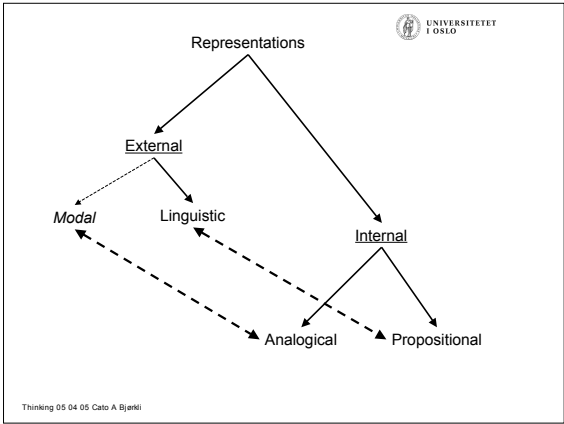
Thinking 05 04 05 Cato A. Bjørkli

Language and thought
is embedded in our lives
and in our sense of selves
as coherent beings - How
can psychology dissect this
experience into themes of
scientific investigation?

Thinking 05 04 05 Cato A. Bjørkli



Thinking 05 04 05 Cato A. Bjørkli



UNIVERSITETET
I OSLO

Conclusions (if any)

Thinking 05 04 05 Cato A. Bjørkli

UNIVERSITETET
I OSLO

Learn both the contents of a theory and the underlying perspective on human thought and action.

Perspectives frame the questions we ask and therefore the answers we get.

Contemporary psychology is still under development and still relate to its founding axioms.

In order to split human experience into focused studies, you will need a good reason.

Thinking 05 04 05 Cato A. Bjørkli

Questions?

Thinking 05 04 05 Cato A Bjørkli

Thinking

Cato A Bjørkli
Psychologist
