

# 1 **THINKING**

Module 28

## 2 **Introduction**

Thinking is broken into:

- ✓ Concept formation (grouping information)
- ✓ Problem solving
- ✓ Visual thought (thinking without language)
- ✓ Judgment
- ✓ Decision making

Broadbent: Cognitive Psych's view the mind as a computer.

3  One of the basic functions of the mind is to organize items into mental groupings called

### Concepts

Sometimes concepts are formed by definition, more often we form concepts by developing a

### Prototype

4  A prototype is a representative of the most typical member of a category.

Complex concepts are ways of looking at the world, that organize our past experiences and provide a way of understanding our future experiences.

Ex: mental maps for

- 1) giving directions
- 2) finding an alternate route
- 3) moving around your home when the lights are out.

## 5 **Problem Solving**

■ Solving problems that cannot be solved in a single step requires a Problem Space.

■ This is the problem solvers internal representation of the problem.

6  It has:

Initial state- the representation of the givens

Goal state- the representation of the desired outcome

Intermediate states- must be passed through from initial to the goal

7  Medin/Ross: noted the importance to distinguish between the Objective Problem Space and the representation used by the problem solver.

Therefore: Due to memory limitations, only a portion of the Objective Problem Space is likely to be represented at one time.

Petals around the rose.

8  Do obstacles in problem solving reflect problems in isolating relevant information, or are they also the result of frustration or performance anxiety?

LeVine: Theory of Hypothesis testing suggests that we begin with a pool of hypotheses and where we select a "working hypothesis" that determines initial responses.

If feedback is consistent with the working hypothesis, then we keep it and refine it.

If feedback contradicts, then we shift to a new working hypothesis that is consistent with the feedback, and also consistent with previous feedback.

9  "Global focusing strategy" says people are able to track many hypotheses at the same time and reject those not consistent with the feedback.

Research supports global focusing strategy when subjects are intelligent adults and the task is relatively simple.

People with limited memory or when a more complex problem is presented, adopt a different strategy.

We call this INSIGHT

AHA!! Experience in problem solving is when the pieces of a solution suddenly fall together.

- 10  We have a tendency to search for information that confirms our preconceptions. This is referred to as CONFIRMATION BIAS

These biases affect our social judgments.

Ex: Messy divorce – Child custody.

D. Levy- Tools of Critical Thinking

- 11  **Perceptual Set:** each of us will seek information which is consistent with our own personal or professional beliefs.
- 12  **Mental Set:** similar to perceptual set except that it affects how you choose to problem solve.

We have a tendency to pay attention to only some aspects of a problem and ignore the rest.

Only the information that we are tuned into will be processed.

- 13  **THE REPRESENTATIVENESS HEURISTIC**  
How we will judge the likelihood of things in terms of how well the information seems to represent our particular prototype.

While this works well much of the time, however, it leads to error when the conclusions run counter to the laws of chance or our limited experience.

Bank Teller Problem

- 14  **Overconfidence Phenomenon**  
■ The tendency to overestimate the accuracy of our current knowledge is a powerful phenomenon.
- 15  **Artificial Intelligence**  
■ Human Brain vs. Computer Intelligence  
Some psychologists argue computers are inherently limited by their lack of common sense, which humans use to interpret everyday experience.
- 16  ***INTELLIGENCE***  
Module 30
- 17
- 18  **What is Intelligence?**

What are the behaviors of intelligent people?

What are the behaviors of unintelligent people?

- 19  **Intelligence is:**

The cognitive abilities of an individual to learn from experience, to reason well, and to cope with the demands of daily life.

- 20  Sternberg asked 100 colleagues and several hundred laypeople their definition of intelligence.

Analysis falls into three (3) categories,

1) practical problem-solving skills

2) verbal skills

3) social competence

Professionals place less weight (importance) on social competence as a part of intelligence than laypeople.

IQ (Intelligence Quotient) as a number, does not fully describe the ability of the person assessed.

- 21  Gregory describes intelligence reflecting the ability to learn from experience, to solve problems, and to use knowledge to adapt to new situations.

Newspaper vendor

- 22  **Multiple Intelligences**

vs.

## **One General Ability**

- 23  **The Maudsley Personality Inventory and Factor Analysis**
- Provides objective approach that shows...
  - a) ...whether answers to certain items tend to form clusters,
  - b) ...which specific questions contribute to each cluster,
  - c) ...each item's specific degree of correlation with each other,
  - d) ...how many clusters are in the data,
  - e) ...the extent to which the clusters are independent of each other,
- Thus: forming clearly definable factors.

- 24  **Eysenck:**

Items 1-6 form a cluster that define a "neuroticism" factor.

Items 7-12 form a cluster that define an "extraversion" factor.

Items 1-2 define neuroticism

Items 11-12 define extraversion

- 25  **Multiple Intelligences**
- Gardner believes that intelligence is more than describing the mind as a “black box” which told us little about what a person could do.
  - The newer view (post 1950's) describe intelligence as understanding, which emphasizes the ability to solve problems or create things that are valued within the culture.
- 26  Gardner believes there are seven (7) separate ways to describe intelligence:
- 1) Linguistic
  - 2) Logical-mathematical
  - 3) Musical
  - 4) Bodily-kinesthetic
  - 5) Spatial
  - 6) Interpersonal
  - 7) Intrapersonal
- 27  **Other opinions of Intelligence**
- Armstrong- 7 kinds of smart
  - Winn – New views of human intelligence
  - Sauer- Web page on MI ([users.mwci.net/~sauer/miass.htm](http://users.mwci.net/~sauer/miass.htm))
  - McKenzie- Creative Classroom Consulting
- 28  Frequently, people are a mixture of two (2) or more of these types. But there is usually one style which is stronger, or the most dominant type.
- 29  **Savant Syndrome**
- Is a condition in which people w/ serious mental handicaps, (either from retardation or major mental illness) have spectacular islands of ability or brilliance.
  - See Treffert's [Extrodinary people](#)
- 30  -More common in males than females and occurs for a very narrow range of skills.

Examples:

- calender
- calculating
- music
- art
- prodigious memory

31

32  Successful Intelligence falls into three aspects

-Analytical

-Creative

-Practical

The ability to adapt to, shape, and select environments to accomplish one's goals.

33  Sternberg:

Successfully intelligent people figure out their own pattern of strengths and weaknesses and find ways to make use of their strengths to overcome their weaknesses.

Ex: Practical Intelligence v Traditional Intelligence

Factory Assemblers

Track Handicappers

34  Emotional Intelligence:

is a significant predictor of future success of young children. Academic achievement is higher, there are fewer behavior problems, and they tend to be in better physical health.

Additionally, for these subjects, relationships through life are more meaningful, and this provides a buffer against stress.

35

36