

- Cognitive psychology has had an enormous influence on the discipline of psychology.

- ^{Journal} Cognitive and Behavioural Practice, focused on using cognitive behavioural therapy for a variety of clients, including refugees from Cambodia with PTSD, adolescents, experiencing pain and urban residents experiencing panic disorder.

- Cognitive Psychology has its critics. One common complaint concerns the issue of ecological validity. ~~of the conditions in~~ validity. ~~of the conditions in~~

- Studies as high in ecological validity if the conditions in which the results research is conducted are similar to the natural setting when the results will appear applied.

- Consider an experiment in which participants must memorize the pairs of unrelated english words presented at 10 second intervals on a white screen in a kareem laboratory room.

The results of the experiment might tell us something about the way memory operates.

However this task is probably low in ecological validity, because it cannot be applied to the way people learn in the real world.

- Most cognitive psychologists prior to 1980s did indeed conduct research in artificial laboratory environments often using tasks that differed from daily cognitive activities. However current researchers are more likely to study everyday issues in natural settings.

- For instance, studying real life issues such as the college students strategies for generating and remembering their passwords.

Psychologists are also studying how cognitive processes operate in our everyday interactions.

In general, most cognitive psychologists must advance by ~~con~~ conducting both ecologically valid and laboratory-based research.

What is ~~Para~~ Paradigm

It includes the assumptions investigators make in studying a phenomenon. Paradigm also specifies what kinds of experimental methods and measures are appropriate for an investigation.

IPA

- ① Information Processing - Approach
- ② ^{PDP} Parallel distributed Processing Approach
- ③ Ecological Approach (not in syllabus).

IPA

The information ^{2 models} Processing Approach
[George A. Miller]

The IPA dominated cognitive psychology in the 1960's and 1970's and remains influential today.

As its name implies the IPA draws an analogy between human cognition

and computerised processing of Information

- Central to the information-processing approach is the idea that cognition (what we see, hear, read about, think about) passing through a system (us or, more specifically, our minds)
- Researchers following an information-processing approach often assume that information is processed (received, stored, recoded, transformed, retrieved and transmitted) in stages and that it is stored in specific places while being processed

One goal within this framework, then, is to determine what these stages and storage places are and how they work.

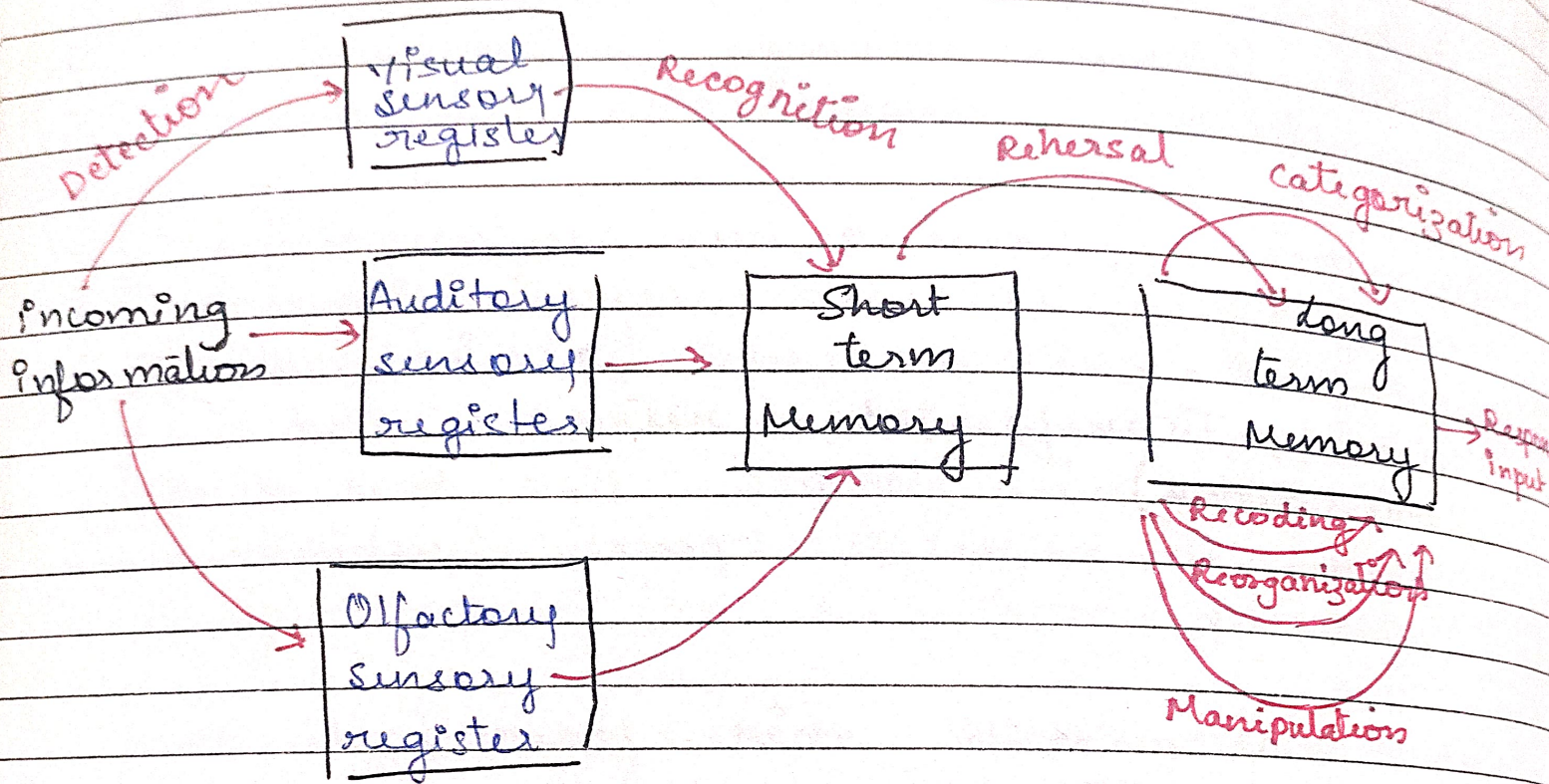
In accordance with the computer metaphor ~~Other assumptions~~ underlie the information-processing theorists assume that people, like computers, are general-purpose symbol manipulators.

Other assumptions underlie the information processing approach as well. One is that people's cognitive abilities can be thought of as "systems" of interrelated ~~capabilities~~

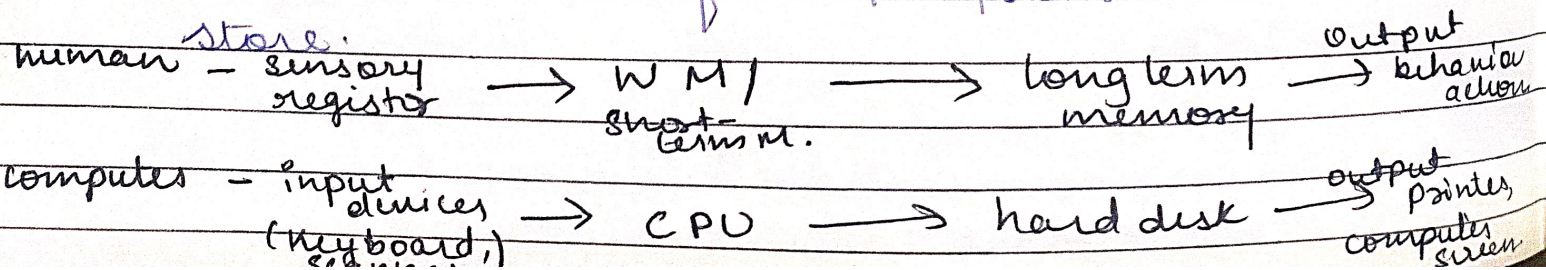
A & Kinson & Shiffrin model of memory

lost ← sensory memory (2 seconds)
 lost ← short term memory (30 seconds)
 lost ← long term memory (old at decades)

~~A general purpose information processing~~
 In accordance with the computer metaphor
 A general purpose information processing system is shown



The various memory stores where information is held for possible later use and the different processes that operate on the information at different points or that transfer it from store to store.



- Certain processes, such as detection and recognition are used at the beginning of information processing; others, such as encoding or retrieval, have to do with memory storage; still others such as reasoning or concept formation, have to do with pulling information together in new ways.
- In this model boxes represent stores and arrows represent processes.
- Altogether, information processing models are depicted best by something computer scientists call flowcharts, which illustrates the sequential flow of information through a system.
- The IP tradition is rooted in structuralism, in that its followers attempt to identify the basic capacities and processes we use in cognition.
- The computer metaphors used in this approach also shows an indebtedness to the field of engineering and communications.

It gives structure to memory
limit. - ^{do}over simplicity

- Psychologists working in the IP tradition are interested in relating individual and developmental differences to differences in capacities and processes in basic.
- Typically, information-processing psychologists use experimental and quasi-experimental techniques in their investigation.

[David E. Rumelhart & Jay L. McClelland]

THE CONNECTIONIST APPROACH

(Parallel Distributed Approach)

- Early in the 1980's, researchers from a variety of disciplines began to explore alternatives to the information-processing approach that could explain cognition.
- The framework they established is known as connectionism also also known as Parallel Distribution Processing (PDP)
- Its name is derived from models depicting cognition as a network of simple processing units.

Nodes - types of neurons.

Because these units are sometimes compared to neurons, the cells that transmit electrical impulses and underlie all sensations and muscle movements connectionists models are sometimes called neural networks.

- Each unit is connected to other units in a large network. Each unit has some level of activation at any particular moment in time. The exact level of activation depends on the input to that unit from both the environment and the other units to which it is connected.
- Connections between two units have weights, which can be positive or negative.

A positive weighted connection causes one unit to excite, or raise the level of activation of units to which it is connected; a negatively weighted connection has the opposite effect, inhibiting or lowering the activation of connected units.

One major difference b/w the IP and PDP is the manner in which cognitive processes are assumed to occur.

In IP models, cognition is typically assumed to occur serially - that is, in discrete stages.

In contrast PDP models assume that cognitive processes occur in parallel many at the same time.

The connectionist framework allows for a wide variety of models, which can vary in the number of units hypothesized, number and pattern of connections among units, and connection of units to the environment.

All connectionist models share the assumption, however, that there is no need to hypothesize a central processor that directs that flow of information from one process or storage area to another.

Feldman and Ballard (1982) in an early discription of connectionism, argue that this approach is more consistent with the brain functions than an IP approach. The brain, they argue, is made up of many neurons connected to one another in various complex ways.

- Like the IPA, connectionism draws from structuralism as interest in the elements of cognitive functioning.

- However, whereas information processors look to computer science, connectionists look to cognitive neuropsychology and cognitive neuroscience for information to help them construct their theories and models.

- Connectionism, being much newer than information processing, is just beginning to map out explaining explanations for individual and developmental differences.

- Most connectionist work seeks to replicate the findings of experimental and qualitative research using computer based or a neural network model.