"A STUDY ABOUT THE DIFFERENT TYPES OF MEMORY AND THEIR BEST UTILIZATION IN THE SYSTEM"

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ABSTRACT

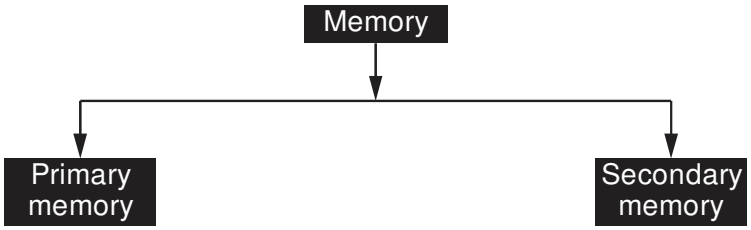
Memory function involves both the ability to remember details of individual experiences and the ability to link information access events to create new knowledge. Prior research has identified the ventral medial prefrontal cortex (VMPFC) and the hippocampus as important for integrating across events in the service of generalization in episodic memory. The degree to which these memory integration mechanisms contribute to other forms of generalization, such as concept learning, is unclear. The present study used a concept-learning task in humans (both sexes) coupled with model-based FMRI to test whether VMPFC and hippocampus contribute to concept across events in the service of generalization in episodic memory. The degree to which these memory integration mechanisms contribute to other forms of generalization, such as concept learning, is unclear. The present study used a concept-learning task in humans (both sexes) coupled with model-based FMRI to test whether VMPFC and hippocampus contribute to concept generalization, and whether they do so by maintaining specific category exemplars or abstract category representations. Two formal categorization models were fit to individual subject data: a prototype model that posits abstract category representations and an exemplar model that posits category representations based on individual category members. Latent variables from each of these models were entered into imaging analyses to determine whether

VMPFC and the hippocampus track prototype or exemplar information during concept generalization. Behavioral model fits indicated that almost three-quarters of the subjects relied on prototype information when making judgments about new category members.

INTRODUCTION

COMPUTER MEMORY

Computer is an internal storage area in a computer which is availed to store data and programs either permanently or temporarily computer memory is broadly divided into two groups and they are: Primary memory , Secondary memory The diagrammatic representation of the classification of computer memory is shown below:



When the main memory holds instruction and data when a program is executing the auxiliary memory or secondary memory holds data and programs which are not intently in use and furnishes long term storage.

The primary memory and secondary memory air further classified into distinct groups and those are explained in the below diagram.

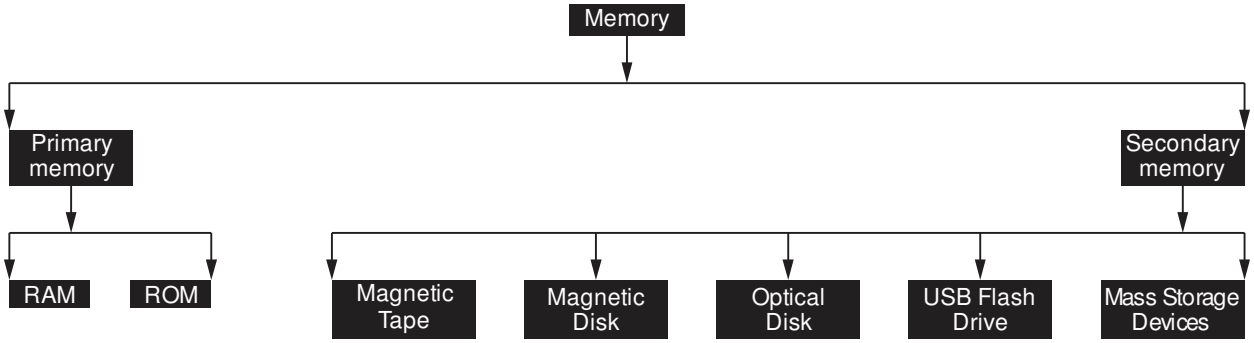


Fig : Classification of Primary memory and secondary memory

PRIMARY MEMORY

Primary memory is the only type of memory which is directly accessed by the CPU. The CPU continuously reads instructions stored in the primary memory and address executes them. Any data that has to be operated by the CPU is also stored. The information is transferred to various locations thought the Bus. Primary memory is of two types. There are:

- RAM
- ROM

RAM: It stands for Random Access Memory. Here data can be stored temporarily, so this type of memory is called as temporarily memory or volatile memory because when power fails the data from RAM will be creased. The information stored in the RAM is basically loaded from the computer's disk and includes information related to the operating system and applications that are currently executed by the processor RAM is considered random access because any memory cell can be directly accessed if its address is known. RAM is of distinct types like SRAM, DRAM and VRAM.

ROM: It stands for read only memory. In this, the data will be furnished by the manufactures regarding the system, so this information can simply be read by the user but cannot add new data or it can't be modified. ROMs are of distinct types.

Types of RAM: RAM is also of two types:

Static RAM: Static Ram SRAM retains stored information as long as the power supply is on SRAM are of higher coast and consume more power. They have higher spaced than dynamic RAM.

Dynamic RAM: Dynamic RAM also known as DRAM, its stored information as DRAM its stored information is a very short time (a few milliseconds) even though the power supply is ON. The dynamic RAM is cheaper and moderate speed and also they consume less power.

Types of ROM: ROM memory is three types names are following:

PROM (Programmable Read only memory):

PROM chip is programmable ROM it is PROM chips to write data once and read many. Once chip has been programmed, the recorded information cannot be changed. PROM is also nonvolatile memory.

EPROM (Erasable programmable Read only Memory): EPROM chips can be programmed time and again by erasing the information stored earlier in it. Information stored in EPROM exposing the chip for some time ultra-violet light.

EEPROM (Electrically Erasable Programmable Read only memory: The EEPROM is programmed and erased by special electrical waves in milliseconds. A single byte of a data or the entire contents of device can be erased.

SECONDARY MEMORY:

Secondary memory or auxiliary memory consists of slower and less expensive devices that communicate indirectly with CPU via main memory. The secondary memory stores the data and keeps it even when the power fails it is used to store or save large data or programs or other information.

The secondary storage device are explained below:

1. Magnetic disks
2. Magnetic tape
3. Optical disk
4. USB flash drive

5. Mass Storage devices

MAGNETIC DISK: Magnetic disks are made of liquid metals or synthetic plastic materials. The disk platter is coated on both the surfaces with magnetic material and both the surfaces with magnetic material and both the surfaces can be used for storage. The magnetic material disk furnishes direct access and is for both small and large computer systems. The magnetic disk comes in two forms.

* Floppy disk
* Hard disk

2. MAGNETIC TAPE: Magnetic Tape: Magnetic tape is serial access storage medium and it can store a large volume of data at low costs. The conventional magnetic tape is in walls of up to 3600 feet made of Mylar plastic tape. The Tape is one half inch in width and is coated with magnetic material on one side. The reel of tape is loaded on a magnetic tape drive unit. During any read/write operation, the tape is moved from one spool to another in the same way as in the audiocassette tape recorder. The magnetic tape is densely packed with magnetic spots in frames across its width.

3. OPTICAL DERIVES: Optical drives are storage medium forms which data is read and to which it is written by lasers. Optical disks can show much more data up to 6GB. Optical store devices are the most widely used and reliable storage devices. The most widely used type of optical storage devices are explained below:

1. CD-ROM
2. DVD-ROM
3. CD-Recordable
4. CD-Rewritable
5. Photo-CD

4. USB FLASH DEVICES: USB flash drives are unmovable, untreatable and are physically much smaller drives, which have the weight of less than 30g. In the year of 2010, the storage capacity of the USB flash drives was as large as 256 GB. Such devices are a good

substitute for floppy disks and CD-ROMS as they are smaller faster, have thousands of times more capacity and are more durable and unlivable, until 2005 most desktop and laptop computers has floppy disk drives but nowadays floppy disk drives have been abandoned in fever of USB ports. The USB connector is often protected inside unmovable cap although it is not likely to be damaged it unprotected. USB flash drives draw power from the computer through external USB connection. The most widely used USB flash drives are the memory cards.

5. MASS STORAGE DEVICES: Mass storage devices after to the saving of large data in persistent manner. Mass storage machines can store up to several trillion bytes of data and hence are used to store or save large data bases, such as the information of customers of a big retail chain and library transactions of students in a college some of the commonly used mass storage devices are explained below:

- Disk array
- Automated tape
- CD-ROM Jukebox.

CACHE MEMORY: Cache memory is a very high speed semiconductor memory which can speed up the C.P.U. It acts as a buffer between the CPU and the main memory it is used to hold those parts of data and program which are most frequently used by the CPU. The parts of data and programs are transferred from the disk to cache memory by the operating system, from where the CPU can access them.

ADVANTAGES: The advantages of cache memory are as follows:

Cache memory is faster than main memory.

i. It consumes less access time as compared to main memory.
ii. It stores the program that can be executed within a short period of time.
iii. It stores data for temporary use.

DISADVANTAGES: the disadvantages of cache memory are as follows:

Cache memory has limited capacity.

It is very expensive.

Sr. No.	Primary Memory	Secondary Memory
1.	Primary memory is temporary.	Secondary memory is permanent.
2.	Primary memory is directly accessible by processor/CPU.	Secondary memory is not directly accessible by CPU.
3.	Nature of parts of primary RAM varies. RAM-volatile in nature ROM-non volatile.	It is always non-volatile in nature.
4.	Primary memory devices are more expensive than secondary storage device.	Secondary memory devices are less expensive when compare to primary memory device.
5.	**Example:** RAM, ROM cache memory, PROM, EPROM *etc*.	**Example:** Hard Disk, floppy disk, magnetic tapes *etc*.

MOS MEMORY: The invention of the MOSFET (Metal oxide-semiconductor field-effect transistor) also known as the MOS transistor, by Mohamed Atalla and Dawon Kahng at Bells labs in 1959 had to the development of metal-oxide-semiconductor (MOS) memory by John Schmidt at fair child semiconductor in 1964.

In addition to highly performance semi-conductor memory we cheaper and consumed less power than magnetic core memory in 1965. J Wood and R. Ball of the Royal Radar establishment proposed digital storage system that uses CMOS (Complementary MOS) memory cells in addition to MOSFET Power devices for the power supply switched cross coupling switches and delay line storage. The development of silicon-gate MOS integrated circuit (MOS IC) technology by Federico Fagin at fair child in 1968 enabled the production of MOS memory chips NMOS memory was commercialized by IBM in the early 1970. MOS memory over took magnetic core memory as the dominant memory technology in the early 1970s.

The term memory when used withers finance to computers most often refers to volatile random access memory. MOS transistor for teach bit of data commercial use of SRAM began in 1965 when IBM introduced their SPAS SRAM chips for the system/360 model 95.

CONCLUSION AND FUTURESCOPE

Learning and memory can be studied from a variety of vantage points.

First, memory is critical psychological function. You can have a behaving organism which doesn't have a memory-which operates purely on reflex, taxis, and instinct to respond to physical stimuli that are present in the current environment. But such as organism is severely limited.

- It can't respond to situations that are not physically present, because it has no way of representing them mentally.
- It can't respond to a rapidly changing environment, because its behavioral mechanisms have been fixed over the slow course of evolutionary time.
- It can't analyze current stimuli for meaning, because it lacks the cognitive capacity to analyze anything beyond the physical stimulus.

REFERENCE

1. McLeod, S. A. (2013, Aug 05) *Stages of memory- encoding storage and retrieval* Simply Psychology.

2. Maltin, M. W. (2005) *Cognition*. Crawfordsville: John Wiley & Sons.

3. Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information.

4. Sternberg, R. J. (1999). *Cognitive Psychology(2nd edition.)*. Fort Worth, TX: Harcourt Brace College Publishers.

5. Brown, G. D. A., & Holmes, C. (1995) Modeling item length effects in memory span.