

The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The main title is centered in the upper half of the slide.

# Memory Processes: Encoding and Storage

DR. TOUMI

# INTRODUCTION

Memory is the term given to the **structures** and **processes** involved in the storage and subsequent retrieval of information.

Memory is essential to all our lives. Without a memory of the past, we cannot operate in the present or think about the future. We would not be able to remember what we did yesterday, what we have done today, or what we plan to do tomorrow. Without memory, we could not learn anything.

Memory is involved in processing vast amounts of information. This information takes many different forms, e.g., Images, sounds, or meaning.

For psychologists, the term memory covers three important aspects of information processing:



# Memory Encoding

- When information comes into our memory system (from sensory input), it needs to be changed into a form that the system can cope with so that it can be stored (transduction).
- Encoding refers to how you transform a physical, sensory input into a kind of representation that can be placed into memory.
- Think of this as similar to changing your money into a different currency when you travel from one country to another. For example, a word that is seen (in a book) may be stored if it is changed (encoded) into a sound or a meaning (i.e., Semantic processing).

Or example, how do you remember a telephone number you have looked up in the phone book? If you can see it, then you are using visual coding, but if you are repeating it to yourself, you are using acoustic coding (by sound).

## **Two Ways of Encoding**

Simply receiving sensory input is not sufficient to encode information. You must attend to and process that input. Encoding information occurs in two ways: automatic encoding and effortful encoding.

# Ways of encoding

## Automatic encoding

1. occurs without any conscious awareness.
2. It occurs effortlessly, automatically, without you having to think about it.
3. Examples include details like time, space, frequency, personal experience, and learning some motor skills

## Effortful encoding

1. occurs when you consciously try to remember information.
2. It requires special attention, thought, and practice. In other words, you have to put in effort to get the information into memory.
3. For example, you would need to pay attention if someone gave you their telephone number or gave you a list of items to pick up at the store.

# Types of Encoding

When environmental information comes into your sensory memory, it needs to be changed into a form that can be stored. There are three main ways in which information can be encoded/changed: visual, acoustic, and semantic.



## Visual

1. Also called imaginal encoding–
2. is the process of encoding images and visual sensory information.
3. Visual sensory information is temporarily stored within the iconic memory before being encoded into long-term storage by means of the visuo-spatial sketchpad.

## Types of encodin g

## Acoustic

1. Also called auditory or linguistic encoding–
2. is the processing and encoding of sound, words and other auditory input for storage and later retrieval.
3. This is aided by the concept of the phonological loop, which allows input within our echoic memory to be sub-vocally rehearsed in order to facilitate remembering.

## Semantic

1. Also called conceptual or abstract encoding–
2. is the process of encoding sensory input that has a particular meaning or can be applied to a particular context. That is, processing a piece of information based on its meaning.
3. Linking new information to existing knowledge
4. Information that is encoded semantically is better remembered than those encoded visually or acoustically because semantic encoding involves a deeper level of processing than visual or acoustic encoding.

# Examples

## Visual

If you try to remember the following list of words, which words do you think you will remember easier?

**Apple hope house respect cup value**

You would probably find it easier to remember the words apple, house, and cup. This is because you can recall the mental images more easily than the words themselves. When you read the word apple, you probably pictured an apple in your mind. Visually encoded information is forgotten easily, therefore, it is the shallowest type of processing.




## • **Acoustic**


You may use acoustic encoding by putting a sound to words or creating a song or rhythm.

Learning the alphabet or multiplication tables can be an example of acoustic encoding.

If you say something out loud or read aloud, you are using acoustic encoding. It is deeper than visual encoding, but not as deep as semantic encoding. It is an intermediate processing.




- Evidence suggests that the principle coding system in short-term memory (STM) is acoustic coding. When a person is presented with a list of numbers and letters, they will try to hold them in STM by rehearsing them (verbally).



Rehearsal is a verbal process regardless of whether the list of items is presented acoustically (someone reads them out), or visually (on a sheet of paper).

The principle encoding system in long-term memory (LTM) appears to be semantic coding (by meaning). However, information in LTM can also be coded both visually and acoustically.



# Storage

Storage is a vital memory process which relates to where the information is stored, how long the memory lasts (duration), how much can be stored at any time (capacity) and what kind of information is held.

The way we store information affects the way we retrieve it. There has been a significant amount of research regarding the differences between short term memory (STM ) and long term memory (LTM).

## **Retaining information in STM**

The main role of the STM is to process information received from the sensory memory, however, it is also a temporary storage unit which holds information for up to 30 seconds while processing. This short span of time can be extended to about 30 minutes thanks to rehearsal and chunking.

## Rehearsal

rehearsal has two types: maintenance rehearsal and elaborative rehearsal. As for maintenance rehearsal, it is a sort of rote repetition of the information in STM. That is, the input is merely repeated in the phonological loop without further processing. For example, repeating a phone number or the name of a person a few dozen times.

## Chunking

chunking is the process of grouping the information we are getting into meaningful units or categories in a way that facilitates learning (encoding and storing).

Example: 568952487125

568 952 478 125



## Retaining information in LTM

- Three major conditions lead to the effective retention of information in LTM: elaboration, organization, and context.

### **Organization:**

Material that is well organized is easier to learn and to remember than separate bits of information,

### **Elaboration:**

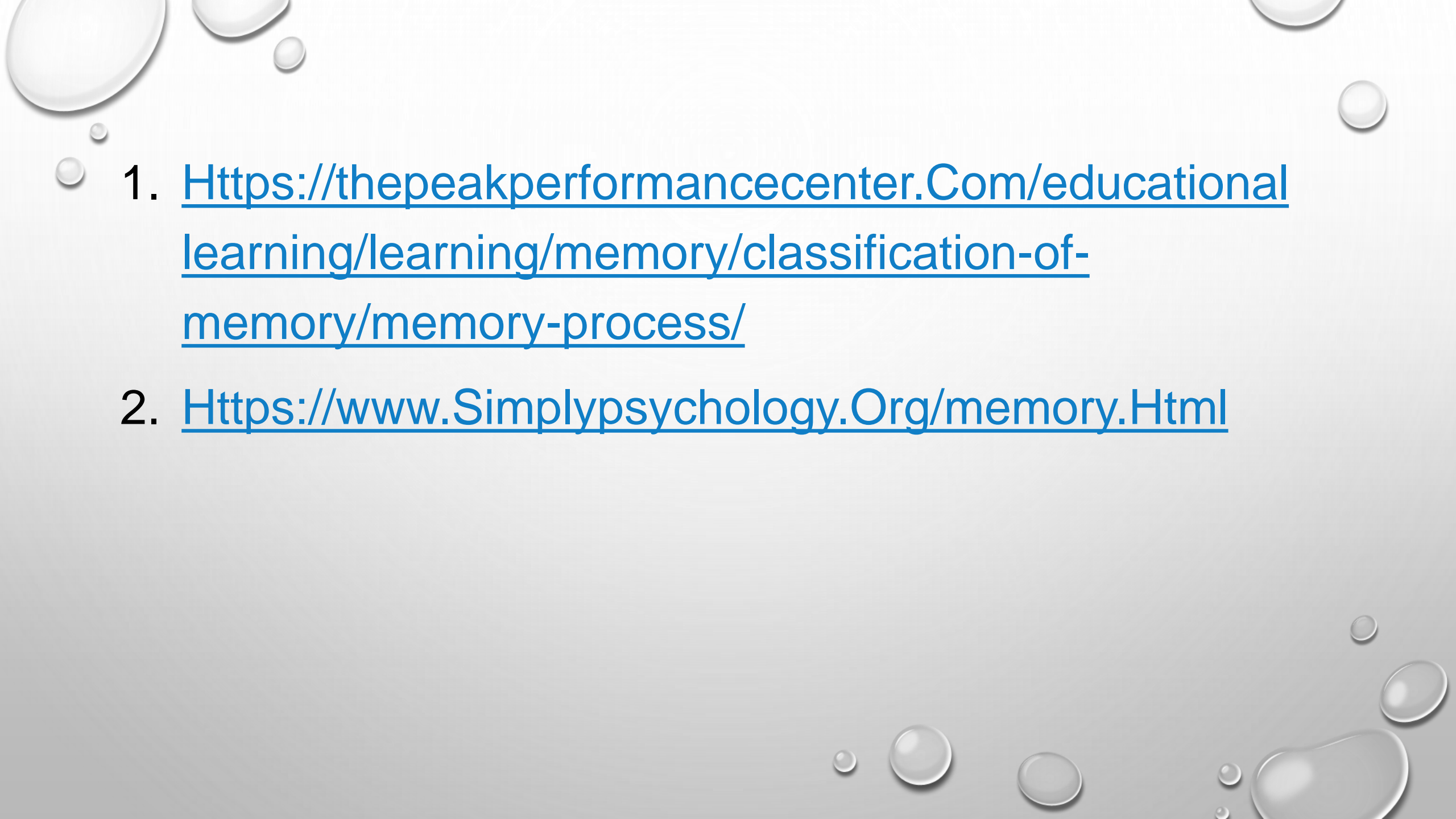
Adding and extending meaning by connecting new information to existing knowledge,

### **Context:**

Aspects of physical and emotional context (places, rooms, what we feel at a particular moment, who is with us) are learned along with other information.

# Homework

1. Definition and types of rehearsal
2. Strategies for retaining information in LTM  
Strategies for retaining information in LTM may rely on the learner him/herself or can be driven by teachers.
3. Factors influencing encoding and storage

- 
1. <https://thepeakperformancecenter.Com/educational-learning/learning/memory/classification-of-memory/memory-process/>
  2. <https://www.Simplypsychology.Org/memory.Html>

**THANK YOU**