



FAMILY

Age-related changes in memory no. 10.243

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Quick Facts...

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The shallowest level of memory is called **sensory memory**, which holds information from the physical environment that has been gained through sensory perception (vision, hearing, taste, touch and smell).

Short-term memory information remains in consciousness about 15 seconds and is not recalled unless it is transferred to and stored in **long-term memory**.

Age appears to have no effect on the capacity of long-term memory.

Introduction

Out of 42.7 million Americans over 60, loss of memory for recent events affects between 7 to 10 percent (3 to 4 million). For some, recall is just slowed down. For others, memory impairment becomes both noticeable and troublesome. Whatever the cause, *serious* memory loss is not an inevitable part of aging or an unavoidable part of growing older.

However, difficulty with memory may give rise to the concern that something is really wrong. The unspoken fear is that loss of memory may represent the beginning of dementia; specifically Alzheimer's Disease. Importantly, most older adults do not have Alzheimer's Disease.

How Memory Works

The shallowest level of memory is called **sensory memory**, which holds information from the physical environment that has been gained through sensory perception (vision, hearing, taste, touch and smell).

If information from sensory memory is to be used in any way, it must be processed at a deeper level-known as **short-term memory**. Short-term, or primary memory relates to immediate recall of information (that is, what is in your mind at the present moment) such as a phone number or a person's name.

Short-term memory information remains in consciousness a brief period of time, usually 15 seconds. This information will not be recalled unless it is transferred to and stored in **long-term memory**, or secondary memory. The process of transferring information from short- to long-term memory is called encoding. Encoding is important and some age-linked problems in memory are a result of faulty ("shallow") encoding. For example, a name

Long-term memory includes all of the information that is not in your thinking at the present moment. It ranges from what you did two hours ago, to your earliest memories from childhood. Long-term memory is like a huge file cabinet or filing system with unlimited capacity.

You are retrieving or recalling information from your long-term memory when you remember a phone number you were given last week, or the name of your pet dog when you were ten years old.

or a phone number in short-term memory will be lost unless it is transferred to long-term memory by visualizing it and/or by repeating it several times, or by associating it with information that has already been learned (i.e. stored in long-term memory). The better a person is able to visualize new information, or associate it with something that has been previously stored (learned), the deeper and more effective the encoding process will be and the higher the likelihood that this information will be recalled later.

Finding and pulling out the information stored in long-term memory is the last step in the process of memory or remembering. This is known as “recall” or “retrieval.”

Not all information stored in long-term memory is the same. It varies with respect to personal significance, specificity and the number of prior opportunities for learning. **Episodic memory** includes episodes that happen in a person’s life, similar to a daily diary. **Semantic memory** includes organized, general and highly learned information, similar to a mental encyclopedia or dictionary. It is widely assumed that age differences in memory are confined to measures of episodic memory, and that measures of semantic memory are mostly unaffected by age.

Conclusions from Age-Memory Research

Sensory memory. To a certain extent, age-related memory problems may be associated with sensory loss. Impaired vision and hearing, for example, limit the amount of information in sensory memory. And when sensory memory is limited, so too is short- and long-term memory. The higher thresholds of sensory stimulation required by some older adults in order to be able to perceive new information may result in memory impairment.

Short-term memory. The most common means of measuring short-term memory is the digit-span test, wherein individuals are asked to recall a sequence of numbers or letters. Generally, among healthy subjects, short-term recall is unaffected by age. However, if individuals are asked to manipulate this information in some way, such as recalling the digits in reverse order, younger subjects appear to outperform older subjects. One explanation is that information in short-term memory is more fragile in the minds of older adults, and decays more rapidly if not attended to or rehearsed. Short-term memory may remain effective and efficient with age but may require more conscious effort to do so.

Lower memory performance scores of some older adults in these studies may be due to many factors not necessarily associated with normal age changes. For example, older subjects may perform more poorly than younger subjects because of cautiousness, fatigue, poor health, fear of failure, and lack of motivation.

If memory were truly effortless, our brains would be crowded with every detail of every event we have ever experienced. Instead, the memory system is made for remembering and forgetting. We do not automatically retain our entire life story. When we want to remember something, we must apply effort.

Recognizing when and where effort should be applied is a critical element in memory success. For example, some people prefer to carry individual checks in a wallet rather than a checkbook, and they have to remember to write the check in the checkbook if they want it to balance each month. Some people hope a receipt will remind them but it doesn't always work.

Long-term memory. Age appears to have no effect on the capacity of long-term memory. What age does seem to affect is the ability to encode and store information, and to retrieve it. Older adults seem less efficient in encoding material and retrieving this material once it has been stored. There are so many problems with this research that it is impossible to say with certainty that age-associated memory problems are centered in encoding, storage or retrieval.

The Effort to Remember

The word "effort" is not meant to imply that memory always involves hard mental work, although that sometimes happens. Effort is viewed as taking appropriate steps toward remembering. The type of effort needed and the difficulty to remember depends on what we want to recall. The key here is to apply the right amount of effort when it is needed.

One response to our diminished ability is to exert additional effort for every memory task. A person could, for example, review everything ten times, or become a compulsive note taker. If these methods work, they should be used. But they can be very time-consuming and may not work for everyone.

A better approach to memory tasks is: 1.) Identify tasks that are easy and do not require much effort for successful memorizing; 2.) Apply effort only to tasks that require it; and 3.) Set memory priorities, so that extra effort is focused only on the most important memory tasks.

Self-Confidence, Self-Concept and Memory

As a person gets older, there is the tendency to blame memory errors on age. In truth, the memory errors of older adults often have the same causes as those that plague younger people: lack of appropriate effort, interference or distraction, inefficient memory strategies, and health problems. When an older person makes the mistake of thinking that all memory problems are due solely to age, four unfortunate situations arise: 1.) memory problems may increase because the person fails to use memory strategies; 2.) older adults may forget how to use memory because they become memory-dependent on their children or spouses; 3.) self-confidence may further weaken because they avoid mental challenges because they feel "too old;" 4.) memory tasks are more difficult because the individual fails to put forth the effort, thinking that extra effort won't help.

Anxiety, Fatigue and Stress

Make a checklist or chart of successes and failures and each time you remember or forget, mark the chart. Once the most difficult and simple memory tasks are identified, expend memory effort only on those difficult memory tasks that are important for you at this point in your life.

Task	Remembered	
	Yes	No
Shopping list	✓	✓✓✓
Telephone number	✓✓✓	✓
Address (adult child)		✓✓✓
Location of car keys	✓	✓✓✓

Sometimes our daily habits and life style can affect our memory and we can improve our memory by making changes in our everyday lives, particularly as they relate to alleviating and/or controlling anxiety, fatigue and stress.

Anxiety. Worrying about your memory – getting scared when you can't remember a name, a date, or other things often only makes it harder to remember. Be patient with yourself and give yourself time to remember.

Fatigue. Tiredness may make you less attentive and less able to take the steps needed to remember. Pace yourself when you do tasks that require new learning. If possible, do them when you feel fresh and rested.

Stress. When you are already handling many stresses, such as moving, illness, or the death of someone you love, you may have less energy to learn new things, or to retrieve them from your long-term memory. It may help to break down tasks and activities into small and more manageable steps.

How to Improve or Maintain Memory

Several suggestions may be useful to improve and/or maintain memory.

- **Increase your sensory abilities.** Making up for losses in vision and hearing is very important. If needed, wear prescription glasses and a hearing aid. Have periodic checkups with a medical professional and make sure your prescriptions are current.

- **Keep medications to a minimum and carefully monitor drug interactions that might affect memory.** Prescription and over-the-counter medications can negatively affect memory, especially when taken improperly. Develop a plan for taking medications as prescribed, and discuss with your physician any changes in memory you feel may be the result of medications. Have all of your medications carefully reviewed on a regular basis by your doctor.

- **Take care of your physical health.** Some illnesses may cause a temporary but treatable decline in memory (infections, thyroid problems, liver and kidney problems, heart disease, diabetes, dehydration).

10 Steps to Remembering Something

1. Plan to put forth effort
2. Eliminate distractions
3. Focus attention
4. Relate it to something you already know
5. Organize information
6. Write down main points
7. Link main points together
8. Relax, take your time; be patient
9. Plan, use external aids to assist recall
10. Practice recalling information

- **Eat a well-balanced diet.** Poor nutrition makes it more difficult for the mind to receive and recall information.

- **Get physical exercise.** A physically fit body enhances the mind and increases blood flow to the brain.

- **Keep mentally fit.** Stay active doing things that require the use of memory (taking classes, writing, drawing, painting, playing a musical instrument, making pottery, doing crossword puzzles, playing chess or cards, teaching, debating).

- **Use external aids.** External aids are methods that store information outside of our minds and serve as cues for memory. Common aids are notepads, calendars, timers, computers, lists, and friends who remind you of tasks to be done. Don't view external aids as cheating or as crutches.

- **Maintain a clean living environment.** Less memory effort is required when household articles have known locations. Some older adults profit from having what is called a "memory place." A memory place is a specific location designated for specific articles (glasses, car keys, etc.) or papers (bills that are due).

- **Use context cues to recall.** Any time an item from the past is not easily pulled from long-term into consciousness, cues may help. Where did you leave your glasses? Think back to the rooms you have been in, the activities you were doing, and the conversations you had. Once you start thinking about specific times, places and events, other details will follow.

- **Depression affects thinking and memory.** Evaluation and treatment of depression should be conducted by a competent mental health professional.

- **Alcohol can affect your thinking and memory.** Consult your physician for evaluation and referral if needed.

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