Active Minds

A program to sharpen your mind

Active Minds Newsletter **Issue 5 - April 2007**

In this issue, Dr. Michelon tells you about .....

The different memory systems in your brain.

Do you want to stay mentally sharp and/or increase your brain power?

Do your residents need mental stimulation?

Are your clients interested in a Memory Workshop?

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Memory systems in your brain

Not just one memory....

People who complain about their memory lapses often say "I have such a bad memory!" By what memory are they talking about?
Evidence coming from years of research have shown that memory is not a unique system. Our brain contains different types of memory.
The first distinction made by researchers is between short-term and long-term memory.

Short-term and long-term memory

Short-term or working memory is the memory system that you use to temporarily hold information in your mind (max. of a 1mn). One example is when you look up a phone number in the phone book: you hold that number in your mind (probably by repeating it to yourself) only until you dial it.
The frontal and parietal parts of your brain are crucial for this type of memory.

Long-term memory is the memory for events that can last from 1mn to decades. Long-term memory capability seems unlimited.

The second distinction made by researchers is within long-term memory. It is between explicit and implicit memory.

Explicit and Implicit memory

Explicit (or declarative) memory is the conscious and intentional recollection of previous events. By opposition, implicit (or procedural) memory is an unconscious, unintentional recollection of past events. Implicit memory contains these types of knowledge that cannot be translated into words such as driving, playing the piano, riding a bike, etc.

Let's take an example. If you make an effort you may remember you first driving lessons (where they took place, the instructor, what happened, etc.) To recollect these memories you use your explicit memory system. Now, let's focus on your driving skills. By now, they must have improved. Do you know how? It is hard to say, right? It is because you improved your driving skills by using your implicit memory.

Explicit and implicit memories do not rely on the same brain structures. They are distinct systems in the brain.

Explicit memory depends mostly on the temporal and frontal parts of your brain. The hippocampus in the temporal lobe is crucial. it is the first structure to be damaged by Alzheimer's disease.

Implicit memory relies on various structures in the brain, depending on the type of knowledge involved. Procedural memory (how to ride a bike, etc) relies mostly on the cerebellum.

Two types of explicit memory

Explicit memory can be furthers dissociated into episodic and semantic memory.

Episodic memory, also called autobiographical memory, consists of the recollection of specific events in the life of a person. For instance, what you had for breakfast this morning is an episodic memory.

Semantic memory consists in all the explicit memories that you have that are not autobiographical. For instance, you know that Paris is in France but don't remember specifically when or where you learnt that information. It has become general knowledge in your mind, it is no longer part of a specific episode of your life.

Aging in the memory systems

The effect of age is not the same on the different memory systems. Implicit memory and semantic memory are relatively spared by age.

In contrast, age greatly affects working memory. It also affects episodic memory, not such much in the recollection of past autobiographical events but in the registration of new events into memory.

As you see it is not that simple! Next time you complain about your memory, keep in mind that parts of it still work very well. And remember that memory can always be improved: keep using it!