Semantic Memory

Semantic memory is the way we are able to understand the meanings of different things such as words as well as knowing facts about the world. It is the second part of declarative memory along with episodic memory. Essentially, thanks to semantic memory, we are able to recall where we live without remembering how or when we did so.

Location

There are arguments among researchers regarding the location of semantic memory. Certain sections of researchers believe that it is stored in the same regions as episodic memory, mainly the hippocampus and medial temporal lobe. Memories are encoded in the hippocampus before they are stored in the medial temporal lobe.

Yet recent research suggests that semantic memory [1] encoding has little to do with the hippocampus. This was demonstrated by experiments on amnesiacs who had damage to their hippocampus which forms part of the hippocampus formation. This formation also includes the perirhinal and entorhinal cortexes which are known as the parahippocampal cortices. The experiment showed that the patients who had damage to their hippocampus but whose parahippocampal cortices were unaffected had the ability to form semantic memories despite a complete inability to do so with episodic memories.

A 2006 study claims that semantic memories are formed in the anterior temporal lobe after experiments were conducted on 12 subjects who had no memory problems in Manchester,

England.

Modality Specific Impairments

There are two main forms of semantic memory disorders. These are modality specific and semantic category specific impairments. A modality can also be defined as a part of a stimulus such as taste and temperature.

Modality impairments can be divided into categories such as visual versus verbal depending on the information type. For example, if we sustained damage to visual semantics, our knowledge of living creatures would become impaired. Functional semantics damage means we would have problems with memories of inanimate objects.

Semantic Category Specific Impairment

An example of an illness caused by a semantic category specific impairment is Alzheimer's. This disease causes sufferers to make mistakes when it comes to naming and describing things.

Another illness associated with this form of impairment is semantic dementia. Those who suffer from this completely lose all prior knowledge they had of people and objects despite being able to speak fluently. Semantic dementia comes from brain tissue loss in the temporal lobe.

History and Future

Endel Tulving initially came up with the idea of semantic memory in 1972. His ideas were supported by research in the 1980s. Two of the most famous experiments relating to semantic memory are Kihlstrom (1980) and Jacoby/Dallas (1981). This paved the way for further research though it is only in the last 15 years where interest in semantic interest has greatly increased on previous levels of research.

This interest has been sparked mainly by an improvement in neuroimaging methods such as functional magnetic resonance imaging. These methods have shown that the brain does not have just one specific region dedicated to semantic knowledge. Instead, semantic memory is a combination of anatomically and functionally distinct systems.

It is now also believed that semantic memory can actually be divided into separate visual categories such as size, color and motion. This is because different parts of the brain are responsible for the retrieval of different semantic memories. For example, the parietal cortex is used to retrieve semantic memories of size while the temporal cortex retrieves memories of color.

Links
[1] http://www.newscientist.com/article/dn10012-semantic-memory-pinpointed-in-the-brain