Abstract

Memory is a fascinating brain function by means of which the nervous system can codify, store, organize, and recover a variety of information relevant to the subject. The formal study of memory started more than a century ago, providing in this time a considerable amount of scientific information on memory functioning. The actual knowledge of memory allow us to consider it far from being unique, isolated or static function, but more as a complex net of memory systems working in parallel for a common goal. Historic evolution of memory concepts and their classifications have progressed simultaneously to our knowledge on these systems. The first empiric approaches to memory description were found in ancient Greece by authors like Plato and Aristoteles, and were based on philosophy, thinking, and introspection and logic methods. However, the first real scientific approaches appeared in the XIX century, by authors such as Ebbinghaus and Lashley, who initiated the experimental study of memory in humans and animals, respectively. The contribution of the intellectual group known as «behaviorist» in the beginning of XX century, was also relevant during this period, and was represented by scientists like Pavlov, Watson, Skinner, and Thorndike, who detailed a variant of learning recognized in our days as associative learning. In turn, this variant can be divided into classic conditioning (associates a stimulus with a response) and instrumental or operant conditioning (associates a stimulus with a specific behavior). Behaviorists claimed that only on observational basis of behavior is possible to know processes linked to learning. However, these authors clearly made a mistake when they stated that knowledge on processes occurring in the brain will always be far of the understanding of the investigator. Later on, one of the hardest evidences for the study of memory processes came from clinic studies of patients with focal cerebral lesions. Penfield, Scoville, and Milner, during the 60's, documented the effects of surgical lesions of temporal lobe on declarative memory, finding selective alterations, such as severe anterograde amnesia and retrograde amnesia with temporal gradient. These findings were accompanied also by a description of memory subsystems remaining intact, despite of those temporal lobe lesions (procedural memory, long-term memory, etc.). Based on these findings, medial temporal lobe was described as a key structure for the acquisition of declarative information. In parallel to clinic studies, a first attempt to coordinate psycho-psychiatric research with the knowledge and scientific protocol of biology occurred in the 60's, thus allowing the emergence of disciplines known as cognitive neuroscience and cognitive psychology or psychophysiology, both created in an effort to explore the cellular and molecular mechanisms responsible for the storage of memory information. The list of
significant findings provided by these two scientific disciplines is extensive, but among the most important are probably those
derived from the study of the most elementary memory processes (i.e. habituation and sensitization) in invertebrate animal models,
such as Aplysia spp. These researches established the basis for the basic cellular requirements for elementary learning, as well as
the molecular basis for short-and long-term memory...

Keywords

Memory, semantic, episodic, procedural, working memory