To what extent does psychological research support Atkinson and Shiffrin's multi-store model of memory?

The multi-store model of memory (MSM) (Atkinson & Shiffrin, 1968) suggests that information flows from one storage system to another (short-term memory (STM) to long-term memory (LTM)). It views sensory memory, STM and LTM as permanent structural components coupled with processes that enable information to pass between these components, e.g. rehearsal. Whilst still remaining influential today and having experimental support, the MSM has also been criticised by contradictory evidence suggesting that it is too simple to explain something as seemingly complex as human memory.

Murdock (1962) gave participants a free recall task and found that the probability of recalling a word depended upon its position in a list. Participants typically recalled those words from the end of the list (recency effect), and from the beginning of the list (primacy effect) well, compared to those in the middle of the list. This is known as the serial position effect and is a consistent finding irrespective of the length of the list, and it lends support to the MSM. The primacy effect occurs as information has been rehearsed and transferred to LTM, and the recency effect occurs as information is still to be found in the STM. Words in the middle of a list are lost as STM only has a limited capacity and they are therefore forgotten. Further support for these findings came from Glanzer & Cunitz (1966), who found that the recency effect is greatest when words at the end of a list are recalled first. Such findings provides support for the MSM as it illustrates that STM and LTM are two distinct structural stores, as well as providing evidence for the use of rehearsal in the transfer of information between these permanent stores.

The process of rehearsal, however, is seen by some researchers as being too general and they believe that it is the type of rehearsal that is crucial in human memory. Craik & Watkins (1973) found that varying the amount of time a participant had to rehearse had little effect on the likelihood that a word was recalled, and that long-term remembering was unrelated to how long a word had spent in STM or how many times it had been rehearsed. Instead, they believe that the probability of a word being recalled was due to different forms of rehearsal, such as maintenance rehearsal and elaborative rehearsal. An earlier study by Glanzer and Meinzer also supported the notion that type of rehearsal is important by noting that participants recalled more information if allowed to rehearse in silence as opposed to aloud. Contrary to the MSM, it seems that it is the kind of rehearsal rather than the amount or mere presence of rehearsal that affects whether information is stored or not.

The belief that the STM and LTM use acoustic and semantic codes respectively is seen as supportive evidence for the MSM. Miller (1956) in his study into the capacity of STM (7 ± 2) suggests that we use chunking as a technique to improve the limited capacity of STM. Yet this cannot occur until certain information in LTM is activated and a match made between the incoming items and their representation in LTM. Miller & Selfridge (1950) found that the knowledge of semantic and grammatical structure in our LTM is used to aid recall from STM. This is supported by Bower & Springston (1970) who found that familiar acronyms were recalled by college students far more accurately than unfamiliar ones that use the same letters. This illustrates that participants recalling familiar acronyms were able to use chunking far more effectively than those recalling unfamiliar acronyms. It seems clear that an acoustic code is not the only one used in STM and this again points to the MSM having an over-simplified view of the processes of memory.

The study of brain-damaged patients, such as HM and Clive Wearing, also lend support of the MSM. The removal of HM's hippocampus left him with severe anterograde amnesia.

His STM is generally normal and he uses rehearsal to retain information for more than 15 seconds, yet he cannot transfer to or retain information in LTM. A similar case study is that of Clive Wearing, who suffered a rare brain infection that has left him suffering from extensive anterograde amnesia. The fact that there seem to be certain kinds of brain damage which affect one memory store but not the other, indicates support for the MSM's claim that there are two distinct memory stores. Atkinson and Shiffrin regard such case studies as 'perhaps the single most convincing demonstration of a dichotomy in the memory system', and Baddeley & Warrington (1970) found experimental evidence that illustrates how amnesics have poorer primacy effects compared to controls, showing how STM memory function is intact and LTM functioning is impaired. Yet another possible implication of such cases is that the MSM unitary LTM is a gross over-simplification.

In conclusion, there is evidence from experimental research that supports the MSM with the use of two component tasks, studies of coding and studies of brain-damaged patients. However, it must be remembered that any experimental evidence found in a laboratory setting lacks ecological validity as studies often involve the recall of meaningless word lists which is not an everyday activity. Case studies too have methodological limitations and the cases of HM and Clive Wearing are not representative of all amnesic sufferers – each case must be seen in isolation as only being representative of that individual. Perhaps the most important evaluation of the research into the MSM is that there is evidence that clearly indicates how over-simplified the model is. Subsequent models of memory, such as the levels-of-processing model and working-memory model, concentrate on how much more complex each component of memory is.