

# Outline and evaluate the working memory model assignment

[Psychology](#)



In 1974 the researchers Baddeley and Hitch argued that the picture of short-term memory (STM) provided by the Multi-Store Model was far too simple. Following the Multi-Store Model, it is believed that STM holds limited amounts of information for short periods of time with relatively little processing, it is believed to be a unitary store. This means that due to its single store it has no subsystems, unlike the Working Memory Model which has many subsystems.

This proves that the Working Memory is not a unitary store. Working Memory is STM. In contrast to the Multi-Store Model, where all the information goes to one single store (Unitary store), there are different systems for the different types of information. Working Memory consists of the Central Executive, The Visuo-Spatial Sketch Pad, The Episodic Buffer and the Phonological Loop. These all link back into the Long-Term Memory (LTM). The Central Executive drives the subsidiary system.

It is the main component of the Working Memory Model and its main role is to direct attention to particular tasks, determining at any time how 'resources' are allocated to tasks. The resources described are the three subsidiary systems, also known as the three slave systems. Although directing these three subsidiary systems it has a very limited capacity and therefore cannot attend to too many things at once although if any of the systems become overworked it will help with some of the workload.

To prove that the Central Executive was the driver behind the subsidiary systems, evidence was needed, Bunge et al (2000) found evidence for the Central Executive and used fMRI scans to see which part of the brain were

most active when participants were tasked with reading a sentence and recalling the final word in each sentence. He believed that activity in the Central Executive should be increased when an individual has to perform two tasks simultaneously (dual-task) rather than one after the other (single-task).

His results from his experiment showed him that some brain areas were active in either dual or single task conditions, but there was significantly more activation in the dual-task condition indicating that increased attention demands were reflected in brain activity. The Visuo-Spatial Sketch Pad is one of the three subsidiary systems and is often referred to as the 'inner eye' as it is mainly used as storage for spatial and visual information. It stores and processes information in a visual or spatial form and is often used for navigation, especially when trying to picture the route.

Only a temporary store but this is still a useful store of visual and spatial information of which spatial information is the distance/ relationship between things. However, Logie (1955) suggested that this subsidiary store could also be divided into a visual cache (store) and an inner scribe which dealt with the spatial relations. This would be helpful as this would prevent confusion between things, although some may argue that there are enough subsidiary stores already.

The Phonological Loop is the part of the working memory that deals with spoken and written material (Auditory information). It is especially handy in remembering a phone number. It consists of two parts; quite similar to the belief of Logie with his divided stores in the Visuo-Spatial Sketch Pad; The Phonological Store often referred to as the 'inner ear' as it is linked to

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speech perception which holds information in speech based from (i. e. spoken words) for a short period of time normally 1-2 seconds.

The Second part of the Phonological Loop is the Articulatory Control Process which is often referred to as the 'inner voice' as it is linked to speech production, this is used to rehearse and store verbal information from the phonological store. The Episodic Buffer is a relatively new store as it was only added in 2000 by Baddeley, he realised the model needed a general store. His evidence for the Episodic Buffer shows that when participants were shown words and then asked for immediate recall, their performance was much better for sentences (related words) than for unrelated words.

This supports the idea of an immediate memory store for items that are neither visual nor phonological and that draw on long-term memory to link the related words. It is used as both the Phonological Loop and the Visuo-Spatial Sketch Pad have specific roles and the Central Executive has very limited storage capacity so as a result there was no where to store both visual and acoustic information. The Episodic Buffer is an extra storage system that has in common with all working memory units, a limited capacity.

It is handy and can integrate information from the Central Executive, The Phonological Loop, The Visuo-Spatial Sketch Pad and also information from the Long-Term Memory. Researchers such as Logie, Baddeley and Bunge generally agree that the short-term memory is made up of a number of components or subsystems. The working memory model has replaced the idea of a unitary store short-term memory as suggested by the multistore

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model. The working memory model explains a lot more and in a lot more detail than the multistore model.

It makes sense a range of tasks- verbal reasoning, comprehension, reading, problem solving and visual and spatial processing, it also applies to real life tasks such as reading which involves the phonological loop subsystem, problem solving which involves the central executive and navigation which involves the visual and spatial subsystem. The Working Memory Model is supported by considerable experimental evidence put forward by many respectable researchers. One such piece of evidence is the Case Study of KF by Shallice and Warrington in 1970.

KF suffered brain damage from a motorcycle accident that damaged his short-term memory. KF's impairment was mainly for verbal information- his memory for visual information was largely unaffected. This shows that there are separate short-term memory components for visual information (VSS) and verbal information (Phonological Loop). Working memory is supported by dual task studies (Baddeley and Hitch, 1976). The working memory model does not over emphasise the importance of rehearsal for STM retention, in contrast to the multistore model.

Although brilliant in most aspects there are a few criticisms in the working of the working memory model. Lieberman criticises the working memory model as the Visuo-spatial sketch pad (VSS) implies that all spatial information was first visual (they are linked). However, Lieberman points out that blind people have excellent spatial awareness although they never have any visual information. Lieberman continues to argue that the VSS should be

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separated into two different components, one for spatial and one for visual; which helps Logie in his suggestion of dividing the VSS.

Although, there is littler direct evidence for how the central executive works and what it does, the capacity of the central executive has never been measured. Working memory only involves STM so it is not a comprehensive model of memory (as it does not include SM or LTM). The working memory model does not explain change in processing ability that occurs as the result of process, time or deterioration of the brain due to old age.