Verbal working memory is a subset of working memory, commonly known as “short term memory.” It refers to the amount of verbal information that the brain can hold and manipulate in order to achieve a goal or solve a problem. Verbal working memory involves more than simply the ability to regurgitate information; it also involves the ability to process information and decide which information is needed for a particular task. It was for this reason that British psychologist Alan Braddeley coined the term “working memory” to replace “short term memory” in scientific literature.

Based on brain imaging techniques, researchers have determined that most processes of the verbal memory take place in the left hemisphere of the prefrontal cortex. Most linguistic information is stored and processed in two nearby areas of the left hemispheric cortex: the Broca's area, which controls grammar and syntax, and the Wernike's area, which controls content and comprehension. This assumption is made based on testing adults, as language has not yet become fully localized in children.

Verbal working memory (WM) tasks typically involve the language production architecture for recall; however, language production processes have had a minimal role in theorizing about WM.

Verbal working memory (vWM) involves storing and manipulating information in phonological sensory input. An influential theory of vWM proposes that manipulation is carried out by a central executive while storage is performed by two interacting systems: a phonological input buffer that captures sound-based information and an articulatory rehearsal system that controls speech motor output. Whether, when and how neural activity in the brain encodes these components remains unknown. Here we read out the contents of vWM from neural activity in human subjects as they manipulated stored speech sounds. As predicted, we identified storage systems that contained both phonological sensory and articulatory motor representations. Unexpectedly, however, we found that manipulation did not involve a single central executive but rather involved two systems with distinct contributions to successful manipulation. Cogan et al., propose, therefore, that multiple subsystems comprise the central executive needed to manipulate stored phonological input for articulatory motor output in vWM [1].

1)
Cogan GB, Iyer A, Melloni L, Thesen T, Friedman D, Doyle W, Devinsky O, Pesaran B. Manipulating stored phonological input during verbal working memory. Nat Neurosci. 2017 Feb;20(2):279-286. doi: 10.1038/nn.4459. PubMed PMID: 27941789; PubMed Central PMCID: PMC5272846.