
Unlike previous studies that used auditory-visual or auditory-spatial delayed matching-to-sample (DMS) designs, we employed an auditory-auditory DMS task to examine the effects of auditory association cortex lesions on the short-term memory capacity of monkeys.

Three Cebus apella monkeys were preoperatively overtrained on closely similar visual and auditory DMS tasks with delays of .5, 4, and 32 seconds. Each then received a two-stage bilateral lesion, with testing after each lesion. The lesions included most of the superior temporal gyrus and upper bank of the superior temporal sulcus, and the anterior part of the lower bank of the lateral fissure.

Although visual DMS performance was completely unaffected by the auditory cortical lesions, auditory DMS performance suffered, particularly after the second operation. One monkey was able to match the acoustic stimuli but displayed a severe retention loss at all delays. The other two monkeys were unable to match the acoustic stimuli, even at the shortest delay. The fact that these subjects could discriminate tones less separated than the tones used in the matching task indicates that the matching deficit was not due solely to sensory impairment; rather, it reflects a deficit in higher-order processing of auditory information.