

The Impact of Sign Language on Generating and Maintaining a Mental Image

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Abstract : Deaf signers have been found to have better mental image performance than hearing nonsigners. The goal of this study was to investigate the ability to generate mental images, to maintain them, and to manipulate them in deaf signers of Taiwanese Sign Language (TSL). In the visual image task, participants first memorized digits formed in a cell of 4×5 grids. After presenting a cue of Chinese digit character shown on the top of a blank cell, participants had to form a corresponding digit. When showing a probe, which was a grid containing a red circle, participants had to decide as quickly as possible whether the probe would have been covered by the mental image of the digit. The ISI (interstimulus interval) between cue and probe was manipulated. In experiment 1, 24 deaf signers and 24 hearing nonsigners were asked to perform image generation tasks (ISI: 200, 400 ms) and image maintenance tasks (ISI: 800, 2000 ms). The results showed that deaf signers had had an enhanced ability to generate and maintain a mental image. To explore the process of mental image, in experiment 2, 30 deaf signers and 30 hearing nonsigners were asked to do visual searching when maintaining a mental image. Between a digit image cue and a red circle probe, participants were asked to search a visual search task to see if a target triangle apex was directed to the right or left. When there was only one triangle in the searching task, the results showed that both deaf signers and hearing non-signers had similar visual searching performance in which the searching targets in the mental image locations got facilitates. However, deaf signers could maintain better and faster mental image performance than nonsigners. In experiment 3, we increased the number of triangles to 4 to raise the difficulty of the visual search task. The results showed that deaf participants performed more accurately in visual search and image maintenance tasks. The results suggested that people may use eye movements as a mnemonic strategy to maintain the mental image. And deaf signers had enhanced abilities to resist the interference of eye movements in the situation of fewer distractors. In sum, these findings suggested that deaf signers had enhanced mental image processing.

Keywords : deaf signers, image maintain, mental image, visual search

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