

Images of reorganized brain functions: Cognitive architecture

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An increasing number of studies detail how the brain naturally reorganizes to overcome failures in cognitive processes due to brain damages. For example, new experiments show how young and old brain networks modify to handle a loss of sight or of hearing. Imaging studies as well as electrophysiological measurements have also revealed that there are qualitative differences between childhood and adulthood injuries in readjusting the brain circuits. Those whose crucial brain areas had been impaired later in life snagged some extra help from a few of the different brain areas showing that the brain's ability to readjust its circuits to cognitive processes is possible at any age. However reorganization processes are quite different according to the onset of the damage, and developmental or acquired childhood impairments may give rise to an atypical cognitive architecture. It also backs the idea that atypical brain development relies especially on the brain's adaptive capacities that serve the reorganized functions compensatory mechanisms rely on. Some research suggests that adults particularly need special brain exercises in order to regain some cognitive functions despite various deficits and a fixed cognitive architecture. This area of research may serve to understand how children and adults overcome failures in cognitive processes. It also may give better insights into how brain networks may be rerouted .may and help those with reading, speech or hearing disabilities.

Suggested reading

Rönnberg, J. Rudner, M., Ingvar, M. (2004) Neural correlates of working memory for sign language, *Cognitive Brain Research*, 20, 165-182. [pdf](#)

Johnston, M.V. (2004) Clinical disorders of brain plasticity, *Brain and Development*, 73-80. [pdf](#)

MacSweeney, M., Campbell, R., Woll, B. Giampietro, V. David, A.S. et al (2004) Dissociating linguistic and nonlinguistic gestural communication in the brain, *Neuroimage*, 22 (4), 1605-1618.