

Neuromyth 2

‘Enriched environments’ enhance the brain’s capacity for learning

This myth states the idea that children should be exposed to rich and diverse stimuli, i.e. an “enriched” environment during the time they are most receptive to learning (assumed to be the time from birth up to three years of age). As a consequence, the common belief is that if a child has not been fully exposed to an enriched environment, it will not “recuperate” later on in life and has lost capacities early in life. This would mean that for full learning to occur, rich diversity and early exposure are important.

The idea that the most effective educational interventions need to be timed with periods during which children are most receptive to learning may have arisen from influential work on early learning in rats. This research showed that rats, which were reared in an enriched and stimulating environment, exhibited a better capability to solve and learn complex maze problems compared to rats that were raised in a deprived environment. Looking into the brain of these rodents, researchers found that neurons in rats, which were raised in an enriched environment, had formed more connections, i.e. synapses and expressed more proteins associated with the maintenance of synaptic contacts (Falkenberg et al. 1992) Thus it seems, that experience tunes the wiring diagram between neurons of the brain (see Greenough, Black & Wallace, 1987). However, further research is necessary to be able to transfer these insights from animal research to human learning. As well it should not be forgotten, that the human brain shows plasticity throughout the whole life and is not limited to an “enriched” environment phase during the first three years of life.

Explanation, by Usha Goswami, Faculty of Education, University of Cambridge, UK, from the article: “Neuroscience and Education”, Reproduced with permission from the British Journal of Educational Psychology, © [The British Psychological Society](#) (2004) 74, p.11.

More references:

For a full debunking of this myth refer the article entitled:

[“Neural Connections: some you use, some you lose”](#) by John.T.Brueer in the December 1999 issue of Phi Delta Kappan, pages 264 - 277.

Refer also to the work by Michael Meaney in the Lifelong Learning Network in:

[Parental Care, Environmental Enrichment, and Neurocognitive Development](#) (a Lab Tour Report), and in the [OECD Report of the Second Meeting of the Lifelong Learning Network](#), January 2004, p. 7-8.

Nilsson M, Perfilieva E, Johansson U, Orwar O, Eriksson PS (1999). Enriched environment increases neurogenesis in the adult rat dentate gyrus and improves spatial memory J Neurobiol. Jun 15;39(4):569-78

[OECD Report of the First High Level Forum on Learning Sciences and Brain Research](#), New York (2000) see p. 7: “Brain Plasticity and Lifelong Learning” by William Greenough.

Hubel DH, Wiesel TN. 1977. Ferrier lecture: functional architecture of macaque monkey visual cortex. Proc R Soc Lond B 1981:1-59

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Lorenz K. (1970) Studies in Animal and Human Behaviour. Translated by R Martin. Cambridge MA: Harvard University Press

Related documents:

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