Vol. 29 | No. 1 (2012)

The Effects of Neurochemical Changes on Language Development

Soonhyuck Park
(Pukyong National University)

Park, Soonhyuck. 2012. The Effects of Neurochemical Changes on Language Development. *Linguistic Research* 29(1), 261-279. There have been evidence that age-related changes in language processing during childhood, adolescence, and even up to elderly period. A very exciting data under consideration rely on the changes that occur throughout the life span that influence the development of language comprehension system. Children appear to employ some tools in their language performance that adults no longer adopt. This paper aims to provide an account of language development in terms of the brain development in magnetic resonance (MR) spectroscopy. With the ability to focus on multiple metabolites in one MR spectroscopy session, this paper scrutinizes the complex biochemical cycles involving counteracting neuro-transmitters and apply the experimental results to the empirical data that the children produce. In doing so, we can hypothesize that language develops as the brain matures in a way that it is reducing the number of unnecessary neurons, such as nerve cell bodies, while maximizing the number of axons that consists of myelinated nerve cells. Prunning of neurons with aging is recognizable by the decrease in the ratio of GABA to glutamate and the seemingly increased neuron-to-neuron connection is detected by greater amount of white matter. **(Pukyong National University)**

Keywords neurochemicals, language performance, early child English, GABA, MR spectroscopy, brain development, myelinated nerve cells, language processing, brain maturation