

THE PSYCHOPHYSIOLOGICAL ASPECTS OF LEARNING PROCESSES
IN SCHOOL CHILDREN.

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This review concerns the contribution that developmental psychophysiology provides to the understanding of the learning processes in normal and abnormal conditions in school children. A constellation of changes in brain electrical activity, autonomic function and spinal excitability is associated both with externally paced actions (EPA) to signal the detection and recognition of expected events and with the organization of self-paced, goal directed actions (SPA). The electrical changes related to EPA are studied using experimental paradigms requiring the subject to perform actions in response to specific external sensory stimuli on the basis of a fixed set of instructions, and are defined Event Related Potentials (ERPs). The changes related to SPA are recorded before and during sensory-motor and cognitive actions without direct interference by external stimuli, and are defined as Movement Related Potentials (MRPs). ERPs results are discussed with an eye on the serial order of information processing, therefore separating the sensory from the motor process. MRPs results take into account the concepts of preparation and updating for action. In this sense, both ERPs and MRPs applied to developmental age represent a useful tool to follow both the functional maturation of the different brain areas and the organization of cognitive processes related to human performance. This double possibility has led to the application of these potentials to investigate children with various neuropsychiatric disorders, autism, attention deficit, hyperactivity, dyslexia, mental deficiency.