Developmental dyslexia’s ‘Cerebellar Deficit Theory’ proposes that a subtle developmental cerebellar dysfunction leads to deficits in attaining ‘automatic’ procedures and manifests as subtle motor impairments in common motor abilities (e.g., balance control, motor learning) along with reading and phonological difficulties. Currently the theory suggests a core deficit in motor skill acquisition. Recently we found that dyslexic readers are inferior in their capability to acquire a novel set of gross hand movements while standing. Furthermore, the results allowed us to assume that the motor learning deficits stem from a deficit within the visual system. However, the nature of the relationship between the presumed motor impairment and dyslexia is still far from being clear. In my work I aim to expand the knowledge of the motor control deficit among individuals with reading disabilities by comparing their neural mechanisms which are involved in the process of motor learning with those of typical readers. This is done by using a functional Near Infrared Spectroscopy device. In addition, it is my purpose to investigate whether the presumable motor deficit may be used as a reading disability marker among the pre-literate population. This will allow the identification of at risk pre-school children and the development of appropriate tools for remediation.