As a result of improved care in the last few decades, up to 3000 children survive preterm birth in the Netherlands. The minority of this group of children develops cerebral palsy. Although the majority survives without serious neonatal medical complications, follow-up studies show subtle cognitive and neuropsychological problems. Here, we focused on the consistently found visuomotor problems in school-aged preterm born children without serious perinatal medical complications. Visuomotor processing is involved in all motor actions under control of visual information processing, such as reaching and grasping, writing, tying laces and buttoning shirts. In the first study, we found that the visuomotor problems in 7- to 10-year-old preterm born children are related to an impairment of elementary visuomotor processes. The results of the second study suggest that the development of these processes is different in some and one year delayed in other preterm born children. These results are surprising given that these processes had received daily practice since birth. This suggests limitations to plasticity of the brain in children with atypical early medical histories even in the absence of serious perinatal brain injuries. In the final two studies, we investigated movement adaptations, which are ecologically more relevant than movements reported in most published investigations. One result of these studies is that preterm born children perform movement adaptations surprisingly well despite impaired elementary visuomotor processes underlying such adaptations. In the Discussion, a process of brain injury formation is described, which may discombobulate the development of specific brain networks in preterm born children without serious perinatal brain injuries, and which provides a framework to investigate why such children experience cognitive and neuropsychological problems later in life.
POINTING TO THE FUTURE

NEW INSIGHTS INTO ELEMENTARY VISUOMOTOR PROCESSES IN TYPICALLY DEVELOPING AND PRETERM BORN CHILDREN

Koenraad Van Braeckel
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Contents

Chapter 1  Introduction  7

Chapter 2  Less efficient elementary visuomotor processes in 7- to 10-year-old preterm born children without Cerebral Palsy: an indication of impaired dorsal stream processes  35

Chapter 3  Difference rather than delay in development of elementary visuomotor processes in children born preterm without Cerebral Palsy: A quasi-longitudinal study  65

Chapter 4  Movement adaptations in 7- to 10-year-old typically developing children: Evidence for a transition in feedback-based motor control  95

Chapter 5  Subtle differences in movement adaptations between preterm born children without Cerebral Palsy and typically developing children at school age  123

Chapter 6  Summary and General Discussion  163

Samenvatting  185

Dankwoord  201

Curriculum Vitae
CHAPTER 1

Introduction