GLOBAL MOTION PERCEPTION THRESHOLDS OF GOOD AND POOR READERS

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Introduction - Global motion perception is the perception of coherent motion in a noisy motion stimulus and it is one of the most important components in visual perception. This task strongly involves extrastriate brain areas, particularly V5/MT, where the dorsal stream dominates [R. Laycock et al., 2006, Behavioral and Brain Function, 2(26), 1-14]. Aim of this study was to determine global motion perception thresholds of typically developing children with different reading skills, using modified random dot kinematograms (RDK).

Method

2055 children in 14 age groups from 6 to 19 years (The procedures of the present study followed the tenets of the Declaration of Helsinki.)

Modified One minute reading test - reading skills

Up to 25 Precentile Poor readers
From 25 Precentile Good readers

Modified Random dot kinematograms (RDK) test (created by S. Fomins)
Signal and noise dots moved at the same velocity at three different speeds
2 deg/s 5 deg/s 8 deg/s

Stimulus

12°x12° white background 200cd/m²
7 arc min,100 black moving dots 1cd/m²

Results – Global motion detection threshold decreased with age for all dot velocities. Motion perception threshold was significantly higher at 8deg/s velocity (p<0,0001), with mean value of 51,3%±0,7, while for 2 and 5 deg/s mean values were 31,7%±0,6 and 33,8%±0,6. Motion perception for poor and good readers differed only for velocity of 2deg/s (p=0,03).

Conclusions - The study confirms that there are two motion systems for achromatic stimuli: one for slow motion, and one for fast motion [1;2]. The study evaluated the motion discrimination threshold rather than motion detection threshold. With increasing stimulus velocity, motion detection becomes easier, but more difficult to class. Magnocellular functions continue improve until 11-12 years of age [3]. Motion sensitivity is a function of this pathway. The study confirmes that adult-like performance condition children reached at 10-11 years. All developmental dyslexic display an elevated motion coherence threshold [4]. Sensitivity to coherence motion for poor readers are worth only at low speed. Outcomes are affected by motion segmentation and transparence of stimuli.


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