ASSESSMENT OF REACHING MOVEMENTS TO REMEMBERED TARGET DISTANCES IN THE LACK OF VISUAL INFORMATION

Karsai István¹, Téczely Tamás², Ángyán Lajos³

(Institute of Physical Education and Sport Science; Institute of Human Movement Sciences, Medical Faculty; Research Group of Human Movement Sciences, Faculty of Adult Education and Human Resource Development, University of Pécs, Hungary ¹, Institute of Human Movement Sciences, Medical Faculty, University of Pécs, Hungary ², Research Group of Human Movement Sciences, Faculty of Adult Education and Human Resource Development, University of Pécs ³, Hungary)

Background In everyday life, people make rapid, goal-directed hand movements to interact with their environment. Because these movements have consequences, it is important to be able to control them with a high level of accuracy. Objective The aim of this study was to examine the precision of reaching movements to remembered target distances in the lack of visual information. Subjects were 12 women and 13 men university students aged 20 +/-0.9 years, and 12 professional basketball players aged 22 +/-5 years. All were right handed with no known neuromuscular deficits. Methods Subjects were standing comfortably at a plane table. A board of 20 cm wide, 100 cm long and 5 cm high was fixed on the table. In the middle of the board, a 1.5 cm deep runaway was made in which a 5 cm high sliding handle might be easily pushed along. Subjects were asked to glide the handle from the start point to the target at 20 cm, then, after returning to the start point, to glide the handle to the target at 40 cm, and, after returning to the start point, to glide the handle to the target at 80 cm apart under visual guidance. The direction of the movements was from left to right. Thereafter, the subjects were asked to reproduce five times these reaching movements to the memorized targets in the same order, starting from the same initial position, with closed eyes. The mean values for the five trials of each series of measurements were used in the statistical analysis. Results The basketball players, having well-trained manual skills, performed better than the non-athlete students did. Increase in the overestimation of the remembered target distances was found under the effect of fatigue. A weight load on the sliding handle caused some decrease in the errors of reaching the remembered targets. No significant gender differences were found. Discussion and Conclusions The results from this study show that basketball players produced smaller errors of reaching the remembered targets than university students did. A possible explanation for difference is that basketball players developed accurate manual skills during their athletic trainings. Fatigue caused overestimation of all remembered target distance, probably, because the subjective need of higher effort. Unexpectedly, a weight load on the handle decreases the errors in all remembered target distance. This result suggests that a mechanically perturbed reaching movement requires higher concentration than the control movement without load.

Keywords: Hand, Basketball, Movement Control

12th Annual Congress of the ECSS, 11–14 July 2007, Jyväskylä, Finland