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A comparison of visual speed to the cardinal gaze positions between Major League Baseball players and amateur prospects

Karla Kubitz, Towson University; Claire-Marie Roberts, University of the West of England - Bristol; Melissa Hunfalvay, RightEye; Nick Murray, East Carolina University

INTRODUCTION Sensorimotor variables (including visual acuity, depth perception, contrast sensitivity, and near-far quickness) have been shown to predict performance in professional baseball players. However, speed of eye movements in the cardinal gaze positions (CGP) in baseball players has received only limited attention. This study tested the hypothesis that the speed of eye movements in the CGP in Major League Baseball (MLB) players would be faster than the speed in amateur prospects.

METHODS Seventeen MLB athletes between the ages of 19 and 34 years (M = 25.8, SD = 3.7) and 160 amateur prospects between the ages of 15 and 19 years (M = 16.7, SD = 2.1) were tested using an eye tracking test (i.e., a RightEye test) designed to measure speed in the CGP. The eight CGP (i.e., speed down, speed down left, speed down right, speed left, speed right, speed upper left, speed upper right, and speed up) of the eyes were tested in a random order. RESULTS The speed in the eight CGP was analyzed using a 2 x 8, Group x Speed, MANOVA.

RESULTS: Significant main effects were decomposed via eight post hoc univariate ANOVAs (i.e., one for each of the CGP directions). For the post hoc analyses, the Bonferroni correction was applied, and p-values were set at $p < .006$. There was a significant difference in speed between MLB players and amateur prospects, $F (8, 168) = 4.52$, $p < .0005$; Wilk's $\Lambda = 0.82$, partial $\eta 2 = .18$. Post hoc univariate ANOVAs showed significant (p's $< .006$) between subjects effects for speed down, speed down left, speed down right, speed left, speed right, speed upper left, and speed upper right. There was a non-significant ($p > .006$) difference in speed between MLB players and amateur prospects for speed up.

CONCLUSIONS With one exception (i.e., the speed up direction), professional baseball players were faster than amateur prospects at all the CGP directions. Future research into CGP performance profiles appears warranted.