ABSTRACT

Reaction time is an important aspect in athletic performance. Simple reaction time (SRT), a response to a single stimulus, may be important to nearly all types of athletes; however, choice reaction time (CRT), a reaction to multiple stimuli, is uniquely required in team sports such as football or basketball. Literature has shown that generally athletes have faster SRT than non-athletes, but there is limited research examining the effect of sport type of either SRT or CRT. The purpose of this experiment is to determine if team sport athletes have faster SRT and CRT compared to individual-sport athletes and non-athletes. Both SRT and CRT were assessed using the Deary-Liwwald reaction time test: a computerized simulation in which subjects were to respond to the images on the screen by pressing the appropriate key or keys. Three groups were measured (n=14/group): team sport athletes (basketball, football, and baseball players), individual sport athletes (track and cross country runners) and non-athletes (no participation in collegiate athletics). Each subject completed both the CRT and SRT assessments in a single laboratory visit, which took approximately 30 minutes. The order in which they completed the tests was randomized. Comparisons between the three groups were made using a one-way ANOVA for SRT and CRT. For the SRT there was a significant group main effect (p = .007). The team sport group (p = .016) and the individual sport group (p = .018) had significantly faster SRT as compared to the control group. However, there was no significant difference between individual sport athletes and team sport athletes for SRT. There was no main effect for CRT (p > .05). Overall, athletes had faster SRT as compared to non-athletes, but there was no effect of sport type. Unsurprisingly, this effect did not exist for CRT, as there were no significant differences among the three groups.

RESULTS, cont.

Choice Reaction Time (CRT): The participants took the CRT test in a closed room with no distractions. A brief description about the choice reaction test was given. There were 8 practice trials followed by 40 experimental trials. The response range measured 200-1500 ms, and the inter stimulus interval was between 1000-3000 ms.

RESULTS,

For SRT, there was a significant difference among the three groups (p = .007). Post hoc tests showed that both the Team-Sport (259.9 ± 4.8 ms) and Individual-Sport (262.6 ± 4.8 ms) groups were significantly faster than the Non-Athletes (281.7 ± 7.6 ms, p = .016 and .018, respectively). For CRT, no significant group difference was detected (p > .05). Team-Sport athletes (403.0 ± 15.8 ms), Individual-Sport athletes (393.7 ± 7.6 ms) and Non-Athletes (487.4 ± 7.8 ms) were not significantly different.

CONCLUSIONS

Overall, athletes had faster SRT than non-athletes, which is consistent with the literature (Akarsu, Caliskan & Dane, 2009); however, there was no differentiation between sport type. We did not find any difference between sport type for SRT, but we did hypothesize that team sport athletes would have a significantly faster CRT. Team sport athletes, such as football or basketball players spend more time practicing activities that require CRT, whereas individual sport athletes, especially distance runners, spend very little of their practice time improving CRT.

Surprisingly, no differences in CRT were found between athletes and non-athletes. The results did not support our hypothesis. This may be due to the sample population, in other studies, professional or elite athletes were compared to sedentary controls (Heitani, 2012), whereas the athletic abilities of the subjects in this study were not as drastically different from the Non-athlete group. A more complex reaction time test such as a test of discrimination may be needed to detect if more subtle differences exist in this population. Additionally, reaction time is variable as evidenced by the standard error, and it is possible that a significant relationship between different types of athletes may be detected with a larger sample size.

METHODS, cont.

Experimental Design: The orders of the two tests were randomized by the test administrator. The combined time for the test and the description of the test totaled approximately 20 minutes. The data are presented as the mean ± standard error. Comparisons between the three groups were made using one-way ANOVA for SRT and for CRT. Post hoc analysis was completed using the Tukey test.

RESULTS, cont.

Choice Reaction Time for Team Sport, Individual-Sport and Non-athletes. No significant difference between sport type, p > .05.

REFERENCES


Figure 1. Simple Reaction Time for Team-Sport, Individual-Sport and Non-athletes. *Team-Sport and Individual-Sport significantly faster than Non-Athletes, p < .05*

Figure 2. Choice Reaction Time for Team Sport, Individual-Sport and Non-athletes.