**ABSCT**

**PURPOSE**

The purpose of this study was to determine the relationship between visual tracking speed (VTS) and reaction time (RT) on basketball-specific measures of performance.

**METHODS**

Twelve professional basketball players (24.7±3.2 y, 193±11.0 cm, 105±20.0 kg) were tested prior to the 202-203 season. VTS was obtained from one core (20 Trials) of the multiple object tracking test, while visual, motor, and physical RT, as well as choice reaction test, were assessed via a light-based testing device. Performance in VTS and RT were compared to basketball-specific measures of performance (assist [AST], turnovers [TO]), assist-to-turnover ratio (AST/TO), steals [STL]) during the regular basketball season. All performance measures were reported per 100 min played. Performance differences between back-court (guards) and front-court (forwards/centers) positions were also examined.

**RESULTS**

Strong relationships were found between VTS and AST (r = 0.77; p < 0.003), STL (r = 0.76; p < 0.003), and AST/TO (r = 0.77; p < 0.003), while a linear relationship was found between TO and VTS (r = 0.48; p < 0.01). RT was not related to any of the basketball-specific performance measures. Back-court players performed significantly (p < 0.05) better in VTS, AST, TO, and AST/TO than front-court players.

**Conclusion**

In conclusion, VTS appears to be related to athlete’s ability to see and respond to various stimuli on the basketball court that results in more positive plays as reflected by greater number of assists and steals, and lower turnovers.

**INTRODUCTION**

**Superior ball control (assists, steals, and turnovers) has been shown to be predictive of a winning outcome in basketball (6, 12, 13).** Across several team sports, effective ball control is believed to be dependent upon how quickly a player can recognize key indicators within a dynamic 3-dimensional environment and react in a timely manner (4, 9).

**Visual-Motor Reaction Time and Perceptual-Cognitive Ability may be related (3, 8, 11).** Visual Motor React Time (VMRT) encompasses an individual’s recognition of a stimulus (from its onset) to the completion of their response to the stimulus (9).

**Perceptual-Cognitive ability** is related to an individual’s ability to effectively allocate attentional resources to the movement patterns of key components within a dynamic environment, where capacity (of items attended) and speed (of tracked movement) determine ability (3).

**Presumably, faster reaction times** and increased perceptual-cognitive ability would endow the athlete with a competitive advantage. However, it is unknown whether either measure is related to any statistical measure that is associated with superior ball control in professional basketball players.

**PURPOSE**

1. To examine the relationships between visual tracking speed and reaction time with game related measures of ball control in professional basketball players.

2. To determine whether visual tracking speed and visual-motor reaction speed were greater in backcourt players in comparison to frontcourt players.

**RESULTS**

**Measures of Ball Control**

Players averaged 9.37 ± 5.69 AST - 100 min^-1; 5.77 ± 1.34 TO - 100 min^-1; 1.53 ± 0.11 AST/TO.

**Perceptual-Cognitive and Reaction**

VTS averaged 78.9 ± 29.1 cm s^-1, while VSRT was 0.41 ± 0.08 sec. MTR-R was 0.27 ± 0.06 sec, and PHY-RT was 0.89 ± 0.10 sec. On the VR-CRT players averaged 8.8 ± 2.5 sec.

**Greater VTS was most likely related to ball control** (AST = 0.78; p = 0.009), STL (r = 0.77; p = 0.003), and AST/TO (r = 0.78; p = 0.003), while it was likely related to TO (r = 0.49; p = 0.109).

**Relationships between Visual Tracking Speed and Ball Control in professional basketball players.**

**SUMMARY & CONCLUSIONS**

**Summary**

Players with greater visual tracking speed were most likely to make more positive plays (e.g. assists, steals, and AST/TO). The NT device presents information (ball trajectories & information) that future vertical ball positions and facilitate tracking (4, 5). Similarly, a basketball player will track court dynamics (ball, teammates, and opposition). Players who quickly determine when and where to pass may provide more time to successfully make a positive play.

**Simple choice reaction time may not be able to effectively distinguish between quick reflexes and anticipatory capability.** To be visual to effective performance, a reaction task may require greater complexity than randomly, flashing light patterns (9). Reacting quickly to random stimuli does not require deductive reasoning since the appropriate response is always the same. In basketball, the appropriate response is never exactly the same.

**Visual tracking speed may also distinguish playing position in professional basketball players.**

Players with greater VTS were very likely to possess a faster VTS which may influence strength for their greater AST/TO production, though they also produced more turnovers. While this may simply be a correlation, the attempts to make a play without a relevant data cannot be used to make this determination. Thus, an evaluation of each position (guard, point, shooting forward, power forward, and center) using a larger sample size across several teams appears warranted.

**Conclusion**

An important role may exist for visual tracking speed in basketball player evaluation and performance. A reaction time task may be very likely to possess a faster VTS than those who performed better in the NT device. This measure may be indicative of the amount of time the player may have to appropriately respond to the demands of a given scenario. Thus, players who are very likely to perform better in superior ball control, as determined by assists, turnovers, AST/TO, and STL, are very likely to perform better in superior ball control. Since these measures are related to team success, the ability to evaluate a player’s VTS ability would prove beneficial for player evaluation and needs analysis.

**REFERENCES**