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COMPARING THE VISUAL SKILLS OF A TRINIDADIAN CRICKET TEAM

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ABSTRACT

This study attempted to determine if there is a correlation between visual skills and physical sporting performance by comparing the members within a Trinidadian cricket team based on their ranked visual skills, as well as their ranked playing ability for batting, fielding and bowling. Visual skills measured were; hand-eye dominance, static visual acuity, dynamic visual acuity, stereopsis, contrast sensitivity, accommodative facility, central and peripheral awareness and eye movement.

SPSS Analysis of data showed that there was a weak correlation between the visual ranking and physical ranking. This can be attributed to the many different factors that contribute to remarkable athleticism. One of which is the perceptual-cognitive skill that allows athletes to use visual information in the process of decision making and to execute accurate and rapid anticipatory movements. Performance in sports may possess an interdependency of both the hardware (quality of system) and software (knowledge based system) elements, and thus, further study must be done into the integration of both systems as a unit.

OBJECTIVE

Research Question- Are the visual skills of a Trinidadian Cricket team linked to their physical performance during games?

Hypothesis- Higher visual abilities are in fact are characterised with a higher sporting ability of athletes.

Objective- The objective of this study is to determine if there is a correlation between visual skills and physical sporting performance by selecting and comparing the members within a Trinidadian cricket team based on their visual skills measured, as well as their ranked playing ability.

INTRODUCTION

In high pace sports defined by perceptual time constraints and requiring the athlete to rapidly process, as well as react to surrounding information, the visual sense is one of great importance. In cricket, the ball is approaching at an approximate speed of 140-160 kph. At these speeds, it is theorised that the limitations of the human visual system are exposed, T. Balasaheb, P. Maman, & J.S Sandhu, 2008.

Nonetheless, athletes are able to perceive visual information in exceedingly dynamic and complex environments, to accurately overcome constraints and perform with timed and steady actions. Such ability has attracted investigation on how the accomplishment of these intricate tasks are cultivated. Are such skills nurtured through countless practice and experience or do they possess natural talent? D.Regan, 2008 suggests that counteracting constraints is often done with prior knowledge of where the ball will hit, accumulated over the previous ball deliveries.

The skills measured in this study is said to contribute to the sport by allowing athletes to; properly adjust their batting stance (hand-eye dominance), to observe and recognise details (static visual acuity), to maintain clarity of the ball in motion (dynamic visual acuity and eye movements), to make relative judgements of depth and distance of the ball or the opponents (stereopsis), to fixate on a central task ahead or object in regard, as well as observing the surrounding environment (central and peripheral awareness), to focus on the ball at varying distances (accommodative facility), to follow the ball as it crosses a change of backgrounds i.e. the ball against the crowd of spectators, the blue / dark skies or even the stadium lights (contrast sensitivity) and to observe the actual colour of the red/white cricket ball against the green grass background, as opposed to what is observed in colour vision defects (colour vision).

METHODOLOGY

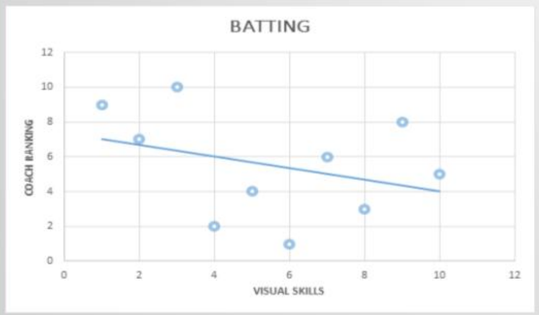
Upon receiving approval from the UWI Campus Ethics Board, the UWI cricket team was selected and brought to the UWI Optometry Clinic for testing of each skills. With a sample size of eleven, only ten of the athletes were available to participate in this study, and were between the ages of 18-40, playing at an intermediate to advanced proficiency level. The following skills were tested using;

- Hand-eye dominance using Edinburgh handedness inventory and miles test
- Static visual acuity using LogMAR chart and autorefractor to estimate refractive errors
- Dynamic visual acuity using a 20/20 landolt C in motion with varying speeds on Powerpoint
- Contrast sensitivity using LogMAR contrast sensitivity chart
- Colour vision using ishihara test
- Accommodative facility using +/- 2.00DS flipper lenses
- Stereopsis using Titmus stereopsis test
- Central vision, Peripheral awareness and eye movements using the Wayne Saccadic Fixator

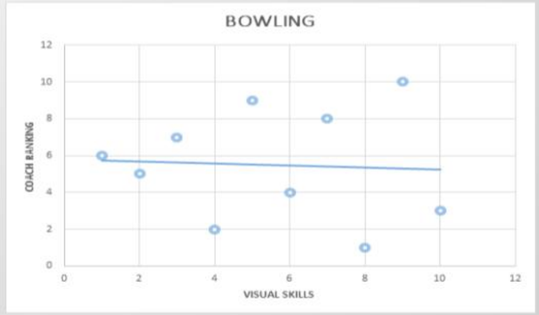
RESULTS

Coach Ranking (based on physical skills)			*Our ranking via weighted averages*		
Batting	*Bowling*	*Fielding*	*Batting*	*Bowling*	*Fielding*
1109	1106	1109	1101	1101	1101
1101	1105	1107	1106	1102	1110
1107	1104	1105	1102	1106	1106
1104	1107	1104	1105	1103	1102
1110	1103	1101	1103	1110	1105
1105	1108	1110	1110	1107	1103
1102	1102	1106	1104	1104	1104
1106	1101	1102	1107	1108	1107
1103	1109	1103	1108	1105	1108
1108	1110	1108	1109	1109	1109

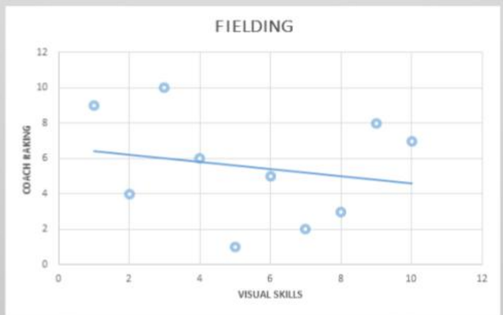
TABLE 1 SHOWING THE RANKING PLACEMENTS OF THE 10 CRICKET PLAYERS BY THEIR COACH BASED ON PHYSICAL PERFORMANCE AND BY US VIA THEIR WEIGHTED AVERAGES OF VISUAL SKILLS MEASURED



GRAPH 1: COACH PHYSICAL PERFORMANCE RANKING Vs VISUAL SKILLS RANKING FOR BATTING



GRAPH 2: COACH PHYSICAL PERFORMANCE RANKING Vs VISUAL SKILLS RANKING FOR BOWLING



GRAPH 3: COACH PHYSICAL PERFORMANCE RANKING Vs VISUAL SKILLS RANKING FOR FIELDING

DISCUSSION

This study investigated whether the visual skills of cricket players were directly related to their physical sporting performance. This was done by comparing a rank amongst the athletes based on visual skills measured and then comparing it to their coach's ranking based on their physical sporting performance. SPSS analysis of the data showed a weak correlation, giving pearson's correlation values of -0.333, -0.055 and -0.200 for batting, bowling and fielding respectively, when compared to the visual skills tested. Ranked results were used to create the scatter plot graphs 1, 2 and 3 shown, which represented this weak correlation and also demonstrated the inconsistency between the coach's ranking and the visual skill ranking. Thus, the hypothesis that higher visual abilities are characterised by a higher sporting ability of athletes, was found to be null.

Similarly, a study done in Ireland, using the same methods of testing, found that there was no difference between the visual skills of cricketers and non-cricketers, and as such, showed no correlation between visual skills and physical skills. Further support of this can be seen in studies by Renee et al, 2015 and Barrett et al, 2017, whose investigations led to identical findings. They suggested that the clinical testing and measurement of vision is not what necessarily assists athletes, but more so their ability to promote their perceptual-cognitive proficiency through cues of anticipation. In other words, these elite athletes may not have better vision but may be able to make better use of it cognitively.

Furthermore, Bahill and LaRitz 1984, and Mann, Spratford and Abernethy, 2013 concluded that in the late stages of the ball's motion, batsmen do not actually use the visual information, instead they use anticipation, allowing them more time to accurately judge the trajectory motion of the ball, to make their hits. According to "Visual Perception and Action in Sport" by A.Williams K.Davids and J.Williams, 2005, actions in sports demand much more than the ability to 'see'. The apparent paradox of naturally expecting athletes to see well, but yet to have them perform skillfully without the level of vision expected, has most definitely segregated the emphasis of research placed into vision and its role in sport. On one hand, researchers focus on the hardware aspect, which refers to the quality of the system, incorporating physical differences in the mechanical and optometric properties of the visual system; while other researchers focus on the software aspect, which refers to the knowledge structures, incorporating cognitive differences in the analysis, selection, coding, retrieval and overall handling of the visual information.

The human visual system is one of high complexity, which operates highly developed perceptions of action founded in knowledge and memory. As such, performance in sports may possess an interdependency of both the hardware and software elements. With this, further study must be done into the integration of both systems as a unit.

CONCLUSION

Results obtained in this study showed a weak correlation between the visual skills and physical sporting performance. With this, the hypothesis was found to be null. This can be attributed to the many different factors that contributes to remarkable athleticism, i.e. perceptual-cognitive skill, which allows athletes to use visual information in the process of decision making and to execute accurate and rapid anticipatory movements. While this study focused on measuring visual skills in a clinical way, further research must be done into the interdependency of the hardware (quality of system) and software (knowledge based system) elements of vision.

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