

AN EVALUATION OF TIME MOVEMENT ANTICIPATION AMONG FEMALE ATHLETES OF VARIOUS SPORTS

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ABSTRACT

Anticipation in sport is the ability of the athlete to make decisions and to act ahead of time (Surkov, 1982). (Taylor 2016) noted that expert advantage in utilising informative cues for anticipation remains stable across sports, the cues that are most important or relevant for effective anticipation varies depending on the type of sport. Zhu (2012) mentioned that there is great potential in using technology-based assessment to overcome the limitations of traditional measurement methods. The Vienna Test System (VTS) developed by Schuh-fried GmbH (Moedling, Austria) is one such computerized system that is able to analyse many different sport psychology-related constructs. ZBA (Time/ Movement Anticipation Test) that measures time and movement anticipation ability, in which a green ball moves at a certain trajectory and suddenly disappears after a while. Participants are required to indicate where the ball hits the target line and the point on the target line where the ball will pass. The present study focused of highlighting possible differences in time and movement anticipation of visual stimuli movement. For this 45 university female athletes aged between 19 to 24 years with a mean and SD of 22.73 ± 2.14 of various sports (i.e. cricket, football and hockey; $N=15$ from each), ZBA was measured for mean deviation time (MDT)-slow and mean deviation time (MDT)-fast. ANOVA results revealed no significant difference among female athletes of different sports when considered on the score of MDT-slow ($F(2,42)= 2.99, p= .061$). But in MDT-fast significant differences was found ($F(2,42)= 6.98, p= .002$). Post-hoc test of Tukey HSD reveals significant difference in time movement anticipation between football and hockey group, also in football and cricket group.

Key words: Movement Anticipation, Time Anticipation, Vienna Test System and Movement Perception.

INTRODUCTION:

The realm of psychological research has traditionally been dominated by subjective self report measures and the domain of sport psychology is not exempt from this trend. Tenenbaum,

Eklund, and Kamata (2012) stated that the major method for measurement in sport psychology research is introspective and subjective in nature. Baumeister, Vohs, and Funder (2007) suggested that the reason for this trend is that self-report measures are less time consuming, cost less, and are easier to administer as compared to other measures such as behavioural observation. However, they also caution that relying solely on self-report measures can have certain negative implications, as subjective measures have their own set of weaknesses and limitations. There is a common occurrence of social desirability, where participants tend to respond in a way that casts them in a positive light (Donaldson & Grant-Vallone, 2002). In light of the current overreliance on self-report measures in sport psychology research, there is a need for alternative forms of measurement to complement and enhance existing findings. Zhu (2012) also mentioned that there is great potential in using technology-based assessment to overcome the limitations of traditional measurement methods. He purported that the use of technology is needed to measure dynamic and intricate constructs and skills that were previously impossible to measure directly. However, he also noted that the field of sport psychology has yet to take full advantage of the many developments in psychological measurement and needs drastic change and improvement in that area. Movement is essential to perform any daily activity. The ability to move efficiently requires control of the body's postural alignment. In other words, one needs strong balance to move efficiently. Without balance, typical tasks such as lifting a bag of groceries, climbing stairs, or standing and sitting would be extremely challenging to do. For endurance athletes, balance helps to run harder, bike longer, and swim stronger. The body reacts to minor divots in the road easily if person have strong balance. In order to improve the balance, it's important to understand the types of balance and incorporate balance exercises into workouts (Harper 2016).

OBJECTIVES OF THE STUDY:

The primary purpose of the study is to evaluate time movement anticipation among female athletes of various sports on Vienna test system.

To perform a movement properly the body needs anticipation time. This is the time the body needs to prepare the movement. In anticipation timing skills vision and proprioception are used

to relate the movements of the body with its environment. Reflexes are co-ordinated, involuntary motor responses (movements). Reflexes have a very short initiation time. Since reflexes need less neural processing to produce a desired movement, more "space" in the brain is available for other activities - integration of thoughts, perceptual responses, regulation and modification, imagery, emotion (Carolien, 2002).

HYPOTHESIS:

There would be significant difference in time/movement anticipation among female athletes of various sports.

MATERIAL AND METHODS:

MATERIALS:

The researcher used the Vienna test system (VTS) to collect the data. The test was administered to the subjects at the Sport Psychology laboratory of LNIPE prior to the actual administration of the testing program all the subjects were properly instructed regarding the procedure of the test. The subjects were tested on the selected psychomotor variables i.e. time movement anticipation, reaction time and sensomotor coordination

Time/Movement Anticipation- It is the visualization of a future event or state or the act of looking forward and a prior action that takes into account or forestalls a later action. ZBA (Time/Movement Anticipation Test) that measures time and movement anticipation ability, in which a green ball moves at a certain trajectory and suddenly disappears after a while. Participants are required to indicate where the ball hits the target line and the point on the target line where the ball will pass. The present study focused of highlighting possible differences in time and movement anticipation of visual stimuli movement. The reliability ranging from $r=0.92$ to 0.98 . The unit of measurement is movement/sec.

METHODOLOGY:

Forty five female athletes of different sports i.e. cricket, football and hockey of university level, 15 from each sport were selected. Subject's age was ranging from 19 to 24 years with a mean and SD of 22.73 ± 2.14 years. All the subjects in present study were tested on Vienna Test Instrument.

STATISTICAL ANALYSIS:

For the purpose of analysis descriptive statistics and ANOVA was used. SPSS 20.0 was used.

RESULTS:

Descriptive statistics (mean and standard deviation) of time/movement anticipation on Vienna Test System for various sports group is presented below in Table 1.

Table 1

Descriptive Statistics of Time/Movement Anticipation Scores of the Female Athletes

			N	Mean (ms)	Std. Deviation
Mean Deviation Time- slow	Cricket		15	0.49	0.25
	Football		15	0.69	0.27
	Hockey		15	0.58	0.15
	Total		45	0.59	0.24
Mean Deviation Time- Fast	Cricket		15	0.65	0.39
	Football		15	1.31	0.68
	Hockey		15	0.85	0.34
	Total		45	0.94	0.56

Table 1 shows the mean and standard deviation of anticipation scores i.e. mean deviation time- slow and mean deviation time- fast among female athletes from all the three sport groups. The graphical representation of the score is illustrated in figure1 & 2.

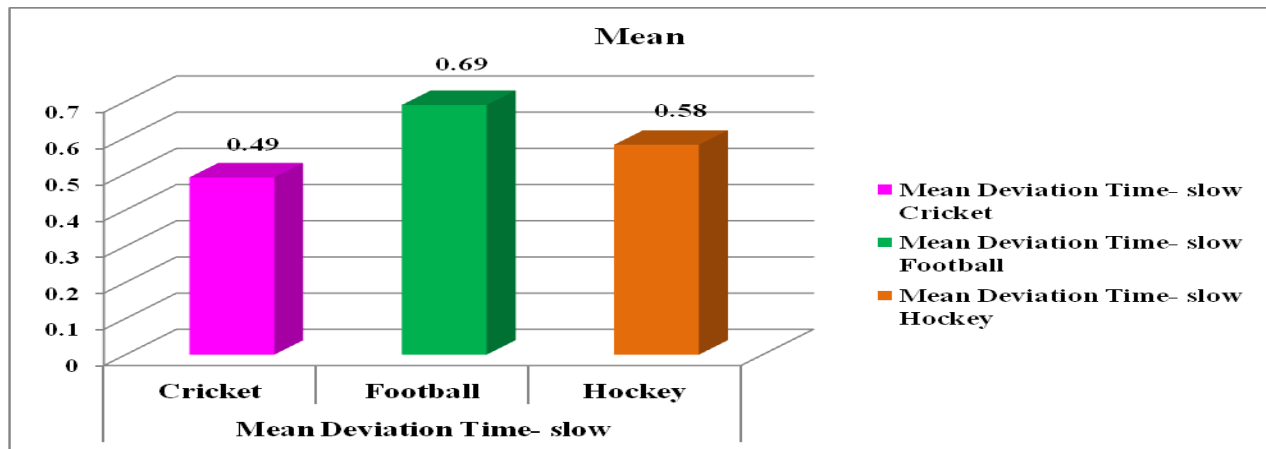


Figure 1. Mean Scores of Mean Deviation Time- slow (ml.sec)

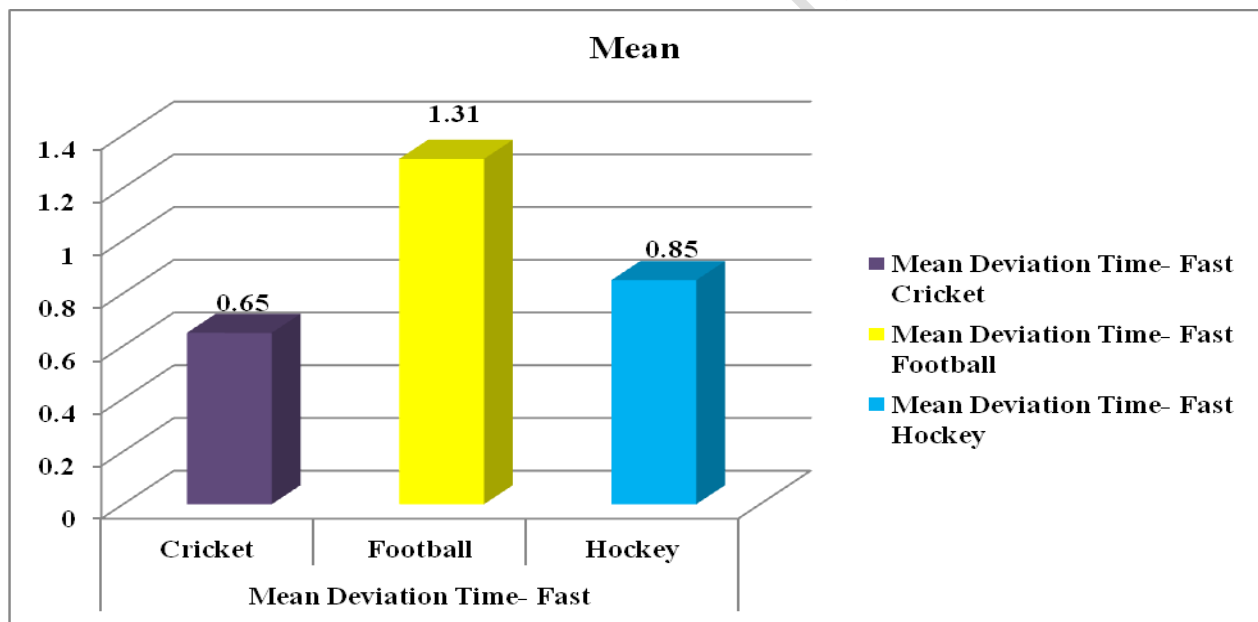


Figure 2. Mean Scores (ml.sec) of Mean Deviation Time- Fast (ml.sec)

Table 2

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Mean Deviation Time- slow	Between Groups	.314	2	.157	2.991	.061
	Within Groups	2.206	42	.053		
	Total	2.520	44			
Mean Deviation Time- Fast	Between Groups	3.424	2	1.712	6.984	.002
	Within Groups	10.295	42	.245		
	Total	13.719	44			

* $0.05 > 3.22$ (2, 42 df)

Table 2 shows the mean of mean deviation time- slow and mean deviation time- fast in table and the results of table have been used to prepare the graphics shown in the above table, which can be used to draw conclusions about post hoc comparison of means.

The f-value of mean deviation time- slow in table 2 is insignificant at 5% level because its p-value (.010) is more than .05. Whereas the f-value of mean deviation time- fast is significant because its p-value is less than .05. Thus the null hypothesis of no difference among the means of the three sports groups may be rejected at 5% level.

As the f-value was found significant in mean deviation time- fast; hence, the post hoc test was applied to see the significant difference between the sports groups.

Table 3

Post hoc Comparison of Means Using Tuckey HSD Test

	(I)Sports	(J)Sports	Mean Difference (I-J)	Sig.
Mean Deviation Time- slow	Cricket	Football	.20427*	.049
		Hockey	.09087	.528
	Football	Cricket	.20427*	.049
		Hockey	.11340	.373
Mean Deviation Time- fast	Cricket	Football	.6586*	.002
		Hockey	.1986	.52
	Football	Cricket	.6586*	.002
		Hockey	.46000*	.038
	Hockey	Cricket	.1986	.52
		Football	.46000*	.038

In table 3 we can see the difference between cricket and football group on their mean deviation time-slow, it is significant at 5% level because the p-value for this mean difference is .049, which is less than .05.

Similarly, the difference between cricket and football group on their mean deviation time-fast score, it is significant at 5% level because the p-value for this mean difference is .002, which is

less than .05. As we can also see the difference between football and hockey group on their mean deviation time-fast score, it is also significant at 5% level because the p-value for this mean difference is .038, which is less than .05.

DISCUSSION OF FINDINGS:

Preconception or time movement anticipation skills being the basic foundation for learning, activities and movement their quantitative assessment helps an athlete improve innate abilities. In this study we evaluate time movement anticipation (ZBA) among female athletes of various sports. ZBA was measured as “Mean Deviation Time-slow” and “Mean Deviation Time-fast” using vienna test system.

From the findings it is clearly seen that there is significant difference in mean deviation time-slow and mean deviation time-fast among female athletes belonging to various sports groups. After analyzing the anticipation ability of female athletes of various sports, the results revealed that there was a difference between cricket and football group group on their mean deviation time-slow score.

Similarly, the difference between cricket and football group on their mean deviation time-fast score was significant. There is a difference between football and hockey group on their mean deviation time-fast score.

This study is supported by Dogan (2009) who conducted a study in which the aim of the study was to determine multiple-choice reaction and visual perception in female and male elite athletes Eating Disorder Prevalence and Symptoms for Track and Field Athletes and Non-athletes. The present study is further supported by Koçak et al. (2010). His study was on Coincidence-anticipation timing and reaction time in youth tennis and table tennis players.

Further on the basis of mean scores it was concluded that cricketers are better than others female athletes in terms of mean deviation time-slow score (0.49 ± 0.25) and mean deviation time-fast (0.65 ± 0.39). Anticipation which is considered as a pair action of nerves on their actions involving both sensory and motor functions and pathways has been both for cricketers in comparison to others.

References

- Harper, B. L. (2016) "How Balance Training Improves Athletic Performance." Volume, DOI:
- Taylor, L. (2016). "Anticipation skill in sport." Retrieved 11 February, 2017, from <http://believeperform.com/performance/anticipation-skill-in-sport/>.
- Baumeister, R. F., Vohs, K. D., & Funder, D. C. (2007). Psychology as the science of self-reports and finger movements: Whatever happened to actual behavior? Perspectives on Psychological Science, 2, 396–403. doi:10.1111/j.1745-6916.2007.00051.x
- behavior research. Journal of Business and Psychology, 17, 245–260. doi:10.1023/A:10196376
- Carolien H. (2002) "The smallest momentum possible" retrieved september 13, 2015 from <http://www.du.ahk.nl/people/carolien/papers/reactiontime.htm>, retrieved
- Doğan B. (2009). Multiple-choice reaction and visual perception in female and male elite athletes. The Journal of Sports Medicine and Physical Fitness, 49 (1): 91-6.
- Donaldson, S. I., & Grant-Vallone, E. J. (2002). Understanding self-report bias in organizational
- Koçak S. (2010). Coincidence-anticipation timing and reaction time in youth tennis and table tennis players. Perceptual Motor Skills, 110 (3 Pt 1): 879-87.

Largo, R.H, Fischer, J.E., & Rousson V. (2003). Neuromotor development from kindergarten age to adolescence: development course and variability. *Swiss Medical Weekly* 133(13-14) retrieved on October 28, 2015 from <http://www.ncbi.nlm.nih.gov/pubmed/12811675>

Mangal S. K. (2007). *Essentials of Educational Psychology*. PHI learning private limited: New Delhi.

Schuhfried, G. (2013). *Vienna test system: Psychological assessment*. Moedling: Schuhfried.

Sport psychological ability and personality assessment with the Vienna Test System SPORT. (2014). Retrieved October 21, 2014, from [http://www.schuhfried.com/viennatestsystem10/vienna-testsystem-](http://www.schuhfried.com/viennatestsystem10/vienna-testsystem-sport/)

Tenenbaum, G., Eklund, R., & Kamata, A. (2012). Introduction to measurement in sport and exercise psychology. In G. Tenenbaum, R. Eklund, & A. Kamata (Eds.), *Measurement in sport and exercise psychology* (pp. 3–7). Champaign, IL: Human Kinetics. [vts/vienna-test-system-sport/](http://www.vts/vienna-test-system-sport/)

Zhu, W. (2012). Measurement practice in sport and exercise psychology: A historical, comparative, and psychometric view. In G. Tenenbaum, R. Eklund, & A. Kamata (Eds.), *Measurement in sport and exercise psychology* (pp. 9–21). Champaign, IL: Human Kinetics.