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### **An Investigation of Determination Ability Through Vienna Test System Among Selected Racquet Sports Players**

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#### **ABSTRACT**

The purpose of the study was to analyze the psychomotor variable that is determination (DT) ability among selected racquet sports players. One hundred sixty male athletes i.e. (tennis-40, badminton- 40, squash- 40, and table tennis 40) were selected on the basis of purposive sampling from Lakshmbai National Institute of Physical Education, Gwalior Madhya Pradesh, India. Their age ranged between 17-24 years with Mean & SD of  $20.73 \pm 2.78$ . In this experiment various racquet sports players (Independent variable) were compared for their determination ability (dependent variable) i.e. reactive stress tolerance and related reaction speed. The determination ability was measured by VTS (Vienna Test System) with sub-factor of median reaction time (DT\_MRT), which shows the time from the appearance of a stimulus to the pressing of a button on the response panel. The data was analyzed by applying One-way analysis of variance (ANOVA) with 0.05 level of significance. The result of the test stated that the determination median reaction time (DT\_MRT) was found significant as the calculated “f” value of 6.617 was found to be greater than tabulated “ f” value of 2.65 at 3,156 df (p value 0.05) among racquet sports players. From the post hoc test it was observed that the tennis players were having high determination ability in comparison to squash, badminton and table tennis players. The finding might be attributed to the reason that the tennis matches are eventually of longer duration in comparison to other racquet sports.

**KEYWORDS:** Vienna system, Individual sports, psychomotor, determination ability.

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## **INTRODUCTION**

Reaction time has a long history as a popular measure of human motor skill performance and it has been associated with motor performance. Sports scientists and coaches were mostly interested in the areas that correspond to the need of human potential and sport performance. The most remarkable studies on physical education and sport especially racket sports suggested that sport and exercise contribution decreases the reaction times. Racket sports such as tennis, table tennis and badminton require a combination of physiological requirements like speed, resistance, strength, motor coordination, short-term maximal or sub maximal efforts, game based techniques and strategies. These demands make the racket sports particularly challenging for athletes at different levels such as professional, amateur and beginner. With the technical, tactical and training sides of the game, some other sides consisting of physical features, quick reflex and rhythmic movements have rendered the game a dynamic sport. In the trainings and major competitions sports scientists and coaches are constantly reluctant over the adoptions of decreasing reaction time for players. Process of adaptation has been very important to determine the some specific features and parameters developing the performance of tennis players as well as racket games<sup>4</sup>.

The object of the Determination Test is to measure “reactive stress tolerance” and the associated reaction speed. In order to be clear what this means, it will be helpful to list the component requirements. VTS was used to compare athletes and non-athletes, as well as athletes from different sports and levels. It was also used to investigate the effect of certain factors on athlete cognitive performance, to induce ego depletion in athletes, and was shown to be a reliable and valid measure of coordinated motor abilities. The review demonstrates that VTS is a useful objective measure of various psychological constructs, and can be used to complement existing subjective measures in the field. There is great potential in using VTS to provide both researchers and applied sport psychologists with valuable information to aid them in their work with athletes, and future research should aim to identify VTS tests that are relevant to each particular sport<sup>1</sup>.

Sounds can help athletes perform better<sup>7</sup>. Especially in fast and short or rhythmic movements, auditory feedback might be superior to visual feedback<sup>10</sup>. Many, if not all, sports skills can be considered rhythmic in nature<sup>8</sup>, and rhythm (or temporal invariance of movement components) is a crucial aspect of many sports skills. Coaches also report using auditory information for error detection as well as a kind of augmented feedback<sup>9</sup>. But there has been little theoretical or empirical research to determine if the auditory information produced by the movement itself is also used for motor control during movement execution.

Action and perception are represented in a common framework. Greater motor experience should therefore lead to improved perception. This has been shown with the help of visual stimuli.

Given that rhythm and timing are important factors in movement perception, auditory self-recognition should also be superior to recognition of auditory stimuli produced by others<sup>2</sup>.

## MATERIALS AND METHODS

### *Selection of the subjects*

To serve the purpose of the study was to investigate the determination test (DT) ability among selected racquet sports. The 160 male athletes i.e. (tennis-40, badminton- 40, squash- 40, and table tennis 40) were selected on the basis of purposive sampling from Lakshmbai National Institute of Physical Education, Gwalior, India.

### *Selection of the variables*

According to the discussion with experts, feasibility, criteria, availability of instruments, equipment and relevance of the present study Determination ability was used.

### *Tools*

Vienna test system (VTS), a leading computerized psychological assessment tool was used for measuring determination test. The determination variable was measured using VTS and side by side are also given the names of the test forms as well.

**Vienna test system (VTS):- Determination Test (DT), S3 form, Free Stimulus Duration 4min (Colours, Tones, Rostock Form).**

The main sub factor of determination test i.e., median reaction time (DT\_MRT)

## STATISTICAL ANALYSIS

In order to examine the hypothesis of the study, descriptive statistics such as mean, standard deviation and comparative statistics such as One-way analysis of variance (ANOVA) was used at 0.05 level of significance. SPSS 20 was used.

## RESULTS

**Table 1. Descriptive Table of Determination Ability among Male Athletes in Individual Racquet Sports**

	<b>Individual Sports</b>	<b>N</b>	<b>Mean</b>	<b>S.D</b>
<b>DT_MRT</b>	<b>Tennis</b>	40	0.83	0.05
	<b>Badminton</b>	40	0.77	0.08
	<b>Squash</b>	40	0.84	0.07
	<b>Table Tennis</b>	40	0.77	0.13
	<b>Total</b>	160	0.8	0.09

Table 1 show that the mean and standard deviation of psychomotor variable that is determination ability (DT) and their the sub factor i.e., median reaction time (DT\_MRT) among male

athletes in individual racquet sports i.e., tennis, badminton, squash, and table tennis are  $0.83 \pm 0.05$ ;  $0.77 \pm 0.08$ ;  $0.84 \pm 0.07$ ;  $0.77 \pm 0.13$ ;  $0.8 \pm 0.09$  respectively.

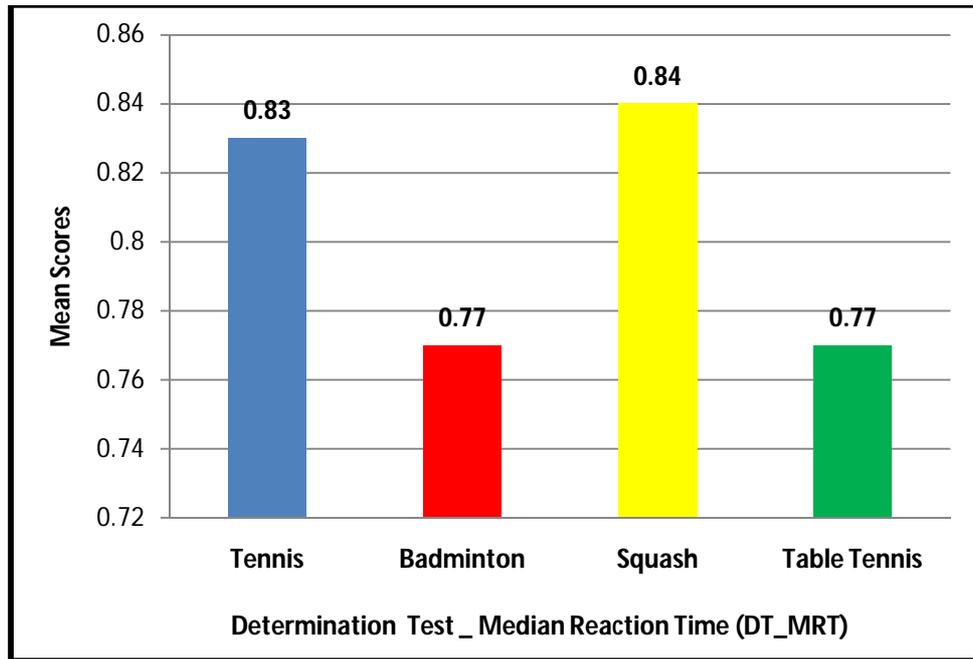


Figure 1. Descriptive Statistics of Determination Ability among Male Athletes In Individual Racquet Sports

Table 2. One Way ANOVA for the Data on Determination Test Median Reaction Time Among Male Athletes in Individual Racquet Sports

		Sum of Squares	df	Mean Square	F	Sig.
DT_MRT	Between Groups	0.161	3	0.054	6.617	.000*
	Within Groups	1.262	156	0.008		
	Total	1.423	159			

Table 2 shows that the determination median reaction time (DT\_MRT) was found significant as the F value 6.617 was found to be greater than tabulated f value (F 2.65) with (3,156) df at 0.05 level of significance (p value 0.05) among male athletes in individual racquet sports.

Table- 3. Post Hoc Table for the Data on Determination Test among Male Athletes in Individual Racquet Sports

(I) Individual Sports	(J) Individual Sports	Mean Difference (I-J)	Std. Error	Sig.
Tennis	Badminton	.05625*	.02	.006*
	Squash	-.01550	.02	.442
	Table Tennis	.05300*	.02	.009*
Badminton	Squash	-.07175*	.02	.000*
	Table Tennis	-.00325	.02	.872
Squash	Table Tennis	.06850*	.02	.001*

\*Significant at 0.05 level

Table 3 shows that the tennis sports there was significant difference found among male athletes in individual sports games were tennis to badminton, table tennis ;badminton to squash &

squash to table tennis as there p values .006,.009;0.000;.001 which were less than 0.05 level of significant.

## **DISCUSSION AND FINDINGS**

The major racket sports include badminton, squash, table tennis and tennis. The growth of sports science and the commercialization of racket sports in recent years have focused attention on improved performance and this has led to a more detailed study and understanding of all aspects of racket sports. Racket sports have provided a vehicle for investigating fast interceptive actions, hand-eye coordination and perception-action coupling in the field of motor control. In conclusion, science has contributed considerably to our knowledge and understanding of racket sports and racket sports has contributed to science by providing unique challenges to researchers. The purpose of the study was to analyze the psychomotor variable that is determination ability among selected racket sports players was found significant<sup>3</sup>.

A tennis player sees an opponent serve the ball and prepares to return it. Reaction time is the brief interval of time it takes for the player to determine how to play the ball before he or she ever begins to move. An athlete's ability to react shows how quickly and effectively her or she can make decisions and initiate actions. Key strategies can accelerate the decision making process to give athletes an edge in competitive situations. Processing time is longer when there are more choices that require different actions. Delays in responses can make the difference between winning and losing.

Racket sports, like tennis and badminton, which consist quick reflex, rhythmic technical and tactical movements, are dynamic sports. These sport branches have in common a rapid succession of mostly short-term maximal or sub maximal efforts and short recovery phases. Besides, some other studies have conducted to compare the relationship between the activity of upper extremity muscle group and reaction time against visual and auditory. It has been very important to determine the some specific features and parameters for developing the performance of tennis and badminton players with same age sedentary. There have been few direct attempts to compare of reaction time of male tennis and table tennis players. Therefore, this study aimed to compare of reaction time of male tennis players, table tennis players and same age sedentary participants against the visual and auditory<sup>4</sup>.

The results of the identification task show that participants could identify their own movement sounds significantly better than strangers' sounds. The coupling of action and perception thus seems detectable via naturally emerging movement sounds (auditory information). Taken together the present study confirms and extends current theories regarding action-perception

coupling, by providing evidence that self–other effects occur in the auditory domain using movement sounds. Future research should explore the underlying (neurophysiological) mechanisms that account for the present results.

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