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Impact and Role of Selected Coordinative Abilities in Racket Sports

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Abstract: ***Performance sports aim at high sports performances and for that the physical and psychic capacities of sportsmen are developed to extreme limits. This normally does not happen in other areas of human activity. In past five motor abilities were recognized as components of physical fitness. These were strength, endurance, speed, flexibility and agility. But since one and a half decade the term agility has been gradually replaced by the term co-coordinative abilities (Martin 1979, Matweyew 1981, Hirtz 1985, Harre 1986, Meinel and Schnabel 1987). It was increasingly felt that if the concept of agility can be discarded and replaced by the concept of co-ordinative abilities, it will be more scientific and practical and this will help in clearing the confusion. Blume (1978) in his path breaking effort suggested that in place of agility there should be seven coordinative abilities which are important in sports. For the purpose of this study a total of 40 male students (20 each from Badminton and Table Tennis) were selected from Lakshmibai National Institute of Physical Education, Gwalior. All the selected subjects were University level players. The purposive sampling method was adopted to select the subjects for the study. All the subjects were in the age category of 18-25 years. The data was collected by administering various coordinative abilities test as suggested by Peter Hirtz. All the five tests were administered to 40 subjects from Badminton and Table Tennis. After the completion of the coordinative abilities test, the subjects were tested on their specific playing abilities tests for Badminton and Table Tennis, subjective judgment by a panel of experts in the respective area of specialization. In order to find out the relationship of Coordinative Abilities to Playing Abilities in Badminton and Table Tennis, Spearman's Rank correlation was employed. The objective of the study was to investigate the relationship of Coordinative Abilities to Playing Ability in Racquet Sports. The level of significance was set at 0.05. There was a significant relationship of Reaction Ability with the Badminton Playing Ability. Whereas insignificant relationship in case of Differentiation, Orientation, Balance and Rhythm Coordinative Abilities with Badminton Playing Ability. There was a significant relationship of Reaction and Differentiation Abilities with the Table Tennis Playing Ability, while there was no significant relationship in case of Orientation, Balance and Rhythm Abilities with Table Tennis Playing Ability.***

Keywords: Coordination abilities and Playing abilities

1. Introduction

Physical activity has been a part of the lives of all people. Human evolution started with movement and the development of the homo-sapiens was largely dependent on the action of muscles. It must be conjectured that the primitive physical activity was primarily a survival activity due to the incessant search for food, clothing, shelter or protection from the hostile environment. Secondly, it becomes a means of preparing youth for adult life, as games are taken from life activities, and become a recognized way to improve strength, speed and skill and other qualities necessary for survival. Performance sports aim at high sports performances and for that the physical and psychic capacities of sportsmen are developed to extreme limits. This normally does not happen in other areas of human activity. As a result, performance sports yield valuable knowledge about the limits to which human performance and various performance factors can be developed. It also leads to discovery of means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high levels. This knowledge can be fruitfully applied to other areas of sports and human activity. In past five motor abilities were recognized as components of physical fitness. These were strength, endurance, speed, flexibility and agility. But since one and a half decade the term agility has been gradually replaced by the term co-coordinative abilities (Martin 1979, Matweyew 1981, Hirtz 1985, Harre 1986, Meinel and Schnabel 1987).

It was increasingly felt that if the concept of agility can be discarded and replaced by the concept of co-ordinative abilities, it will be more scientific and practical and will help in clearing the confusion. Blume (1978) in his path breaking effort suggested that in place of agility there should be seven coordinative abilities which are important in sports.

2. Methods and Materials

For the purpose of this study a total of 40 male students (20 each from **Badminton and Table Tennis**) were selected from Lakshmibai National Institute of Physical Education, Gwalior. All the selected subjects were University level players. The purposive sampling method was adopted to select the subjects for the study. All the subjects were in the age category of 18-25 years.

Keeping in mind the feasibility criteria and the specific purpose of the present investigation the below mentioned variables were found appropriate and worthy of investigation.

Dependent Variables :

- Differentiation ability
- Orientation ability
- Reaction ability
- Balance ability
- Rhythm ability

Independent variables

- Playing ability of Racket sports.

The criterion measure adopted for the present study playing ability of each subject was obtained on the specific test batteries evaluation.

Tests Used:

Coordinative ability tests

- Numbered Medicine Ball Run Test for Orientation ability.
- Backward Medicine Ball Throw Test for Differentiation ability.
- Ball Reaction Exercise Test for Reaction ability.
- Long Nose Test for Balance ability.
- Sprint at the given rhythm test for Rhythm ability

Specific playing ability tests

- Lockhart-McPherson Badminton Test.
- Mott and Lockhart test for Table Tennis

The necessary data was collected by administering various coordinative abilities tests as suggested by Peter Hirtz. All the five tests were administered to 40 subjects from Badminton and Table Tennis. After the completion of the coordinative abilities tests, the subjects were tested on their specific playing abilities tests for Badminton and Table Tennis. In order to find out the relationship of Coordinative Abilities to Playing Abilities in Badminton and Table Tennis, Pearson's Product Moment Correlation was employed. The level of significance was set at 0.05.

3. Results

All the results and findings of the study have been reported as follows:

Table 1: Descriptive Statistics of Badminton Players' Coordinative Ability and Playing Ability

	Mean	Std. Deviation
Balance Ability	8.80	1.41
Differentiation Ability	10.10	2.65
Orientation Ability	7.54	0.60
Reaction Ability	1.66	0.21
Rhythm Ability	6.31	0.52
Badminton Playing Ability	34.70	3.44

The table 1 reveals the descriptive statistics as mean and standard deviation of selected Coordinative Abilities. The mean and standard deviation of the Reaction ability (1.65± 0.21) was found to be the lowest among the Badminton players, whereas the mean and standard deviation of Differentiation ability was (10.10± 2.65) highest. The mean and standard deviation for Balance ability, Orientation ability and Rhythm ability were 8.80 ± 1.41, 7.54 ± 0.60 and 6.31± 0.52. The mean and standard deviation of Badminton Playing Ability was 34.70 ± 3.43.

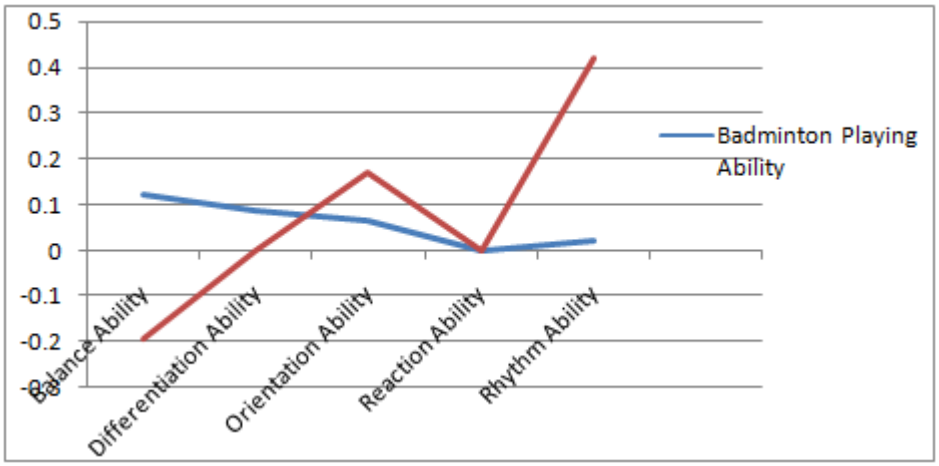

Table 2: Descriptive Statistics of Table Tennis Players' Coordinative Ability and Playing Ability

	Mean	*Std. Deviation*
Balance Ability	10.57	1.88
Differentiation Ability	7.00	1.41
Orientation Ability	11.61	1.56
Reaction Ability	1.62	0.27
Rhythm Ability	11.12	1.47
Wrestlers Playing Ability	44.15	2.68

Table 2 shows the descriptive statistics as mean and standard deviation of selected Coordinative Abilities. The mean and standard deviation of the Reaction ability (1.62± 0.27) was found to be the lowest among the Table Tennis players, whereas the mean and standard deviation of Orientation ability was (11.61± 1.56) highest. The mean and standard deviation for Balance ability, Differentiation ability and Rhythm ability were 10.57 ± 1.88, 7.00± 1.41 and 11.12± 1.47. The mean and standard deviation of Table Tennis Playing Ability was 44.15 ± 2.68.

Table 3: Correlation of Different coordinative abilities with Badminton and Table Tennis Players

Coordinative Abilities	*Badminton Playing Ability*	*Table Tennis Playing Ability*
Balance Ability	.124	-.195
Differentiation Ability	.090	.514*
Orientation Ability	.065	.169
Reaction Ability	-.841*	-.859**
Rhythm Ability	.020	.420

*Significant at 0.05 level,
$r_{.05}$ (18) = 0.444

Table 3 reveals that there was a significant relationship of Reaction Coordinative Ability with the Badminton Playing Ability as calculated value was greater than tabulated value at 0.05 level of significance with 18 degree of freedom, while there was no significant relationship in case of Balance, Differentiation, Orientation and Rhythm Coordinative Ability with Badminton Playing Ability at 0.05 level of significance with 18 degree of freedom.

It was found in table 3 that there was a significant relationship of Differentiation and Reaction Coordinative Ability with the Table Tennis Playing Ability as calculated value was greater than tabulated value at 0.05 level of significance with 18 degree of freedom, while there was no significant relationship in case of Balance, Orientation and Rhythm Abilities with Table Tennis Playing Ability at 0.05 level of significance with 18 degree of freedom.

4. Findings

Under the continuum of Racket sports, the Playing Ability of Badminton and Table Tennis players were correlated with all the five Coordinative Abilities separately. The analysis had revealed that in Badminton there was a significant relationship of Reaction Ability with the Playing Ability, while there was no significant relationship in case of Balance, Differentiation, Orientation and Rhythm Ability with Badminton Playing Ability. The factors responsible for the aforesaid findings can be attributed to nature of movements required in the Badminton game. It's a game where the players need to react quickly and effectively to the opponents attack causing the improved reaction ability. Whereas rest of the components of the Coordinative Abilities might be only the supporting factor to enhance the performance. Similar results were found in the study of Chahal and Singh (2012) who conducted a study to establish a relationship between motor abilities and clear skills of Badminton players and found out that Speed, Flexibility, Reaction Time, Balance and Explosive Power were not correlated with Badminton Playing Ability of boy Badminton players.

In Table Tennis there was a significant relationship of Differentiation and Reaction Ability with the Playing Ability, while there was no significant relationship in case of Balance, Orientation and Rhythm Ability with Table Tennis Playing Ability. Again the nature of activities involved in Table Tennis gives an individual or player a sense of movements as well as they need quick movements as quick reactions to the balls coming from the opponents side. Apart from this the non-significant relationship of Balance, Orientation and Rhythm Coordinative Ability might be caused due to the factor that game does not involves the change of position and movements of the body in time and space in relation to a definite field of action. The game also lacks the much needed Balancing ability or the Rhythmic motor movements.

Coordination abilities are essential in order to develop and perform optimal Table Tennis Strokes (forehand and backhand) and the movement techniques. It is considered that coordination abilities are basic elements for an athletic skill. Practicing those abilities with specific exercises has a better result at improving the technique of those skills (Druckman & Swets, 1988).

5. Conclusion

The objective of the study was to investigate the relationship of Coordinative Abilities to Playing Ability in Racket sports. There was a significant relationship of Reaction Ability with the Badminton Playing Ability, while there was no significant relationship in case of Balance, Differentiation, Orientation and Rhythm Abilities with Badminton Playing Ability. Significant relationship was also found between Differentiation and Reaction Ability with the Table Tennis Playing Ability, while there was no significant relationship in case of Balance, Orientation and Rhythm Abilities with Table Tennis Playing Ability.

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