RELATIONSHIP OF COORDINATIVE ABILITIES TO PERFORMANCE IN BADMINTON

BY

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A THESIS

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DEDICATED

TO MY

RESPECTED FAMILY

MEMBERS AND

TO ALL

MY WELL WISHERS

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Vita (Contd.)

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- Represented District Badminton Team in Mohan Memorial Badminton Championship Held at Jamshedpur in 1995.
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Represented LNIPE Squash Racket Team in All India Intervarsity Tournament Held at Delhi University, Delhi in 2000.

- Represented M.P. State Squash Racket Team in the National Squash Championship Held at the India Cement Squash Academy, Chennai in 2001.
- Represented LNIPE Badminton Team in West Zone Inter University Competition Held at Jiwaji University, Gwalior in 2001.
- Represented LNIPE Squash Racket Team in All India Intervarsity, Mumbai in 2001.
- Participated in Madhya Pradesh State Squash Racket Tournament Held at Scindia School, Gwalior in 2002.
- Represented LNIPE Badminton Team in West Zone Inter University Competition Held at Dr Harisingh Gaur Sugar University, M.P. in 2002.

- Represented LNIPE Squash Racket Team in All India Intervarsity Tournament held at Mumbai University in 2002 and secured Fourth Place.

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A.M

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INTRODUCTION

The twenty first century is the most rapidly changing century of all time. Rapidity of changes created unusual demands on individuals and on system of education. Today education must not only include the body and knowledge, but also to develop inquiring minds that will enable them to comprehend and accept what is to come tomorrow.

As Jacks, the British philosopher, puts it, living becomes an art only, "when work and play, labour and leisure, mind and body, education and recreation, are governed by a single vision of excellence and a continuous passion for achieving it."[1]

[1] Lawrance Pearsall Jacks, Education Through Recreation (London: University of London Press, 1932), P1

In sports today best performance can only be achieved through a meticulously planned, executed and controlled training system loosed on the scientific knowledge, theoretical and methodical fundamentals of sport training.

The developing tendencies in international sport, specially in team games are identified as the increase in game tempo, tougher body game and greater variability in technique and tactics. An increased performance level can only be achieved by working and training of all major components i.e. technique coordination, tactics, physical fitness and psychological qualities. Apart from these components, one more factor which is now a days known as coordinative abilities also play a greater role. A sportsman can compete effectively only by a certain coordinative mastery of the technique.

Coordinative abilities enable the sports man to do a group of movements with better quality and effect.

The speed of learning of skill and it's stability is directly dependent on the level of various coordinative abilities. Coordinative abilities are needed for maximal utilization of conditional abilities, technical skills and tactical skills.[2]

Insufficient training of coordinative abilities limits the performance ability specially at higher levels. On the contrary, better developed coordinative ability provide an essential base for faster and effective learning, stabilization and variation in technique and their successful execution in game situation.

In different sports requirement of coordinative abilities are different and these abilities ensures higher movement efficiency and movement economy, whereas is some sports events they helps in higher movement frequency with high explosiveness and force application. In strength sports they help in putting

[2] Hardayal Singh, Science of sports Training (New Delhi D.V.S. Publication, 1991), p 165

maximum effort in a short time and at the right time. But, where the technique dominates the event these abilities helps in better learning, stabilization, variability and autoimmunization. Apart from performance improvement, in team games coordinative abilities ensures an effective use of tactical abilities in the continuous changing situations.[3]

In sports seven coordinative abilities are of crucial importance. In different sports the relative importance of these abilities is however different.[4] Physical education teachers and coaches should

be well versed with these importance of coordinative abilities in putting up good performance in various physical education activities and sports. Differentiation ability enables the sportsman to perceive micro-differences regarding the temporal, dynamic, spatial aspect of movement execution and the differentiation

[3] Lother, Kalb ed. Introduction into General Theory and Methodics of Training – The Performance factor coordination – Technique DHFK (Leipzig, 1989) p. 15
[4] Hardayal Singh, Science of Sports Training, p. 165

can be in regards to an implement or movement like serve, movement serve, water feeling, etc.[5] Orientation permits the sportsman to determine the position and movement of his own body and/or of a moving object (opponent, partner) with regard to space.[6] Coupling or combination movement allows the sportsman to coordinate partial movement of his body with regard to space, time, and dynamics.[7]

Reaction ability permits the sportsman to effective action quickly and purposefully according to a signal and for a sudden change in situation.[8] Balance ability helps in keeping the total body in a certain position or to re-establish it.[9] Rhythmic ability enables the sportsman to perceive the externally given rhythm and to reproduce it in a motor action. It also denotes the

[5] Ibid.
[6] Ibid.
[7] Ibid.
[8] Ibid., P. 120
[9] Idib., P. 167

ability to reproduce a rhythm, existing in motor memory in motor action.[10]

As research scholar himself related to the game of Badminton, know about the importance of required coordinative abilities which can be helpful for Badminton players. The game of Badminton is believed to be a variation of the ancient game of battledore. A similar game called “Poona” was played by British army officers station in India and it was in Poona that the first rules were framed in 1870s.

The basic strokes in Badminton which really to be practiced in isolation are such as serve, clear, smash, lob, net return/play and drop and after that only concerned players are introduced to the game situation. Because of being an individual game it requires all the components generally required by any other sport or team. Further one basic requirement is foot work which

[10] Ibid.

takes place primarily by the adjustment of the special, dynamic and temporal parameters.

The optionally developed coordinative ability especially in the childhood are an invaluable asset for learning of complex technique in advancement stage is dependent upon the level of required coordinative ability. They are prerequisite of Badminton performance.

Statement of Problem

The purpose of the study was to determine the relationship of selected coordinative abilities to the performance in Badminton.

Delimitations

1. This study was delimited to twelve Badminton players who represented the Institute men University team in Inter-Varsity tournament.

2. This study was further delimited to the coordinative ability tests as suggested by Peter Hirtz.[11]

3. The study was delimited to the following coordinative ability:-

   a) Orientation ability.

   b) Differentiation ability.

   c) Reaction ability.

   d) Balance ability.

   e) Rhythm ability

Limitation

Variation in performance of coordinative abilities due to motivational factors which might have affected the study were considered as limitation of study.

[11] Peter Hirtz ed. Koordinative Fachigbeiten in Schulsport (Volb and Wissen Volkseigner Verlag, Bertin, 1985), p. 127

Hypothesis

On the basis of available literature and scholar's own understanding of the problem it was hypothesized that there would not be any significant relationship of selected coordinative abilities to the performance in Badminton.

Definition And Explanation Of Terms

Coordinative Abilities

"Coordinative abilities are understood as relatively stablized and generalized patterns of motor control and regulation process."[12]

"Coordinative abilities are the generalized psycho-matric performance pre-requisite having the function of movement control and regulation."[13]

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[12] Hardayal Singh, Science of Sports Training, p. 164

[13] Kalb, Introudction inti General Theory and Methodoes of Trainig- The Performance Factor coordination Techniqu, p. 15.

Orientation ability

"Orientation ability is the ability to analyze and change the position and movement of the body in space and time related to defined action."[14]

"This is the ability to determine the body position and its parts in time and space in relation to gravity, playing field, other players with ball equipment etc."[15]

The definition given by Dietrich Harre is accepted for the purpose of the study.

Differentiation Ability

"It is the ability to achieve a high accuracy and economy (time adjustment) of separate body movement and mechanical phase of total movement. It is based upon conscious, precise distinction between force;

[14] Hardayal Singh, Science of Sports Training, p. 166
[15] Dictrich Harre ed. Principles of Sports (Sports-verlag Beriu, 1982): p.151.

space and time parameters of the motor process and these existing in the athletes mind.[16]

According to Singh[17] differentiation ability is the ability to achieve a high degree of accuracy and economy to separate body movements, and movement phase in a motor action. It depends upon the sportsmen's capacity to precisely differentiate between minute differences in temporal, spatial and dynamic parameters of a movement compared to the movement appropriate for the study.

Reaction Ability

"According to Singh[18] reaction ability is the ability to react quickly and effectively to a signal."

"Reaction ability is the ability to initiate quickly and to perform rapid and well directed actions following a signal."[19]

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[16] Dietrich Harre ed. Principles of Sports (Sportverlag Berlin, 1982), p. 151
[17] Hardayal Singh, Science of Sports Training, p. 165
[18] Ibid., p. 166

For the purpose of the study, the first definition given by singh is found more appropriate and hence accepted.

Balance Ability

"Singer defined balance as the ability to maintain body position which is necessary for the successful performance of sport skill."[20]

"Balance may be defined as the ability of the individual to maintain his neuromuscular system in a static condition."[21]

For the purpose of this study the definition of Singer is accepted.

Rhythm Ability

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[19] Harre, Principles of Sports Training, p. 153.
[20] Robert N. Singer, Motor Learning and Human Performance (New York: Macmillan Publishing Co., Inc., 1978), p. 236
[21] Harold M. Barrow and Rosemary McGee, A Practical Approach to Measurement in Physical Education (Philadelphia: Lea and Febiger, 1979), p.113

”It is the ability to preview the externally given rhythm and to reproduce it in motor action. It also denotes the ability to reproduce a rhythm, existing in motor memory, in motor action.[22]

Significance of the Study

The present study is likely to reveal which of the coordinative abilities have relevance for jumping sports or footwork like badminton. The study will also indicate the difference in their dominance in footwork activities. After having identified the various coordinative abilities, the experts in these sports will be in a position to prepare a specific training program for these coordinative abilities in order to improve the performance in Badminton which otherwise is likely to stagnate at higher levels because of poor coordinative exploitation of the sportsman.

These are some other significances; which are as follows:

[22] Hardayal Singh, Science of Sports Training, p. 167

1. The current study will help in determining the relationship of coordinative abilities to performance of Badminton player.
2. This study will also help in further comparing of the percentage required in the game of Badminton for maximum performance.
3. The result of the study will help the higher authority to understand the importance of coordinative abilities.
4. It will also helps the professionally working as physical education teacher, activity coordinator, coach and the players itself to identify those abilities which contribute to the performance required throughout the game situation.

Chapter II

REVIEW OF RELATED LITERATURE

Sincere efforts have been made by the research scholar to locate literature related to this study. The relevant studies found from various sources which the research scholar has come across, are cited below:

Lynch[1] conducted a study on muscular power, reaction time and visual perception as related to striking abilities of second grade children. The purpose of the study was to determine if significant difference existed in the performance of various physical and perceptual variables. In addition, an attempt was made to predict striking ability and to determine whether significant differences existed in the performances of males and females on selected variables tested.

[1] Debbies Lynch, "Muscular Power, Reaction Time and Visual Perception as Related to Striking Abilities of Second Grade Children," Dissertation Abstract International 45 (Feb. 1985): p.2240-A.

The study utilized female and male second grade children who were studying in the Fayettiville Arbanas School for the spring semester of 1983. Ninety subjects completed all testing procedure.

An independent 't' test was computed along with Pearson's Product Moment Correlation stepwise multiple regression was utilized for the prediction of striking ability. Mean for each variable were computed for female and male groups as each variable.

Mulmisur[2] investigated selected physical characteristic of junior Davis cup players and their relation to success in tennis agility, arm-shoulder coordination, pure speed, depth perception, reaction time, movement time, dynamic balance. All rebounding, weight and height showed no significant correlation with success in tennis for this group.

[2] Michael Mulmisur, "Selection Physical Characteristics of Junior Davis Cup Players and There Relation to Soccer in Tennis," Completed Research in Health, Physical Education and Reaction 9 (1967):p. 92.

Panhonin[3] selected 33 college women randomly from level beginning classes who were tested in agility, balance, eye hand coordination, grip strength, height and arm and shoulder strength. The criterion of tennis ability was the combined 't' score from the Dyer Test, Broer and Miller Forehand-Backhand test and skill rating by three judges. The most economical predictor of tennis ability balance and arm-shoulder grip strength for a 'r' of 62. Adding right hand grip strength improved the 'r' slightly although the correlation of grip strength and eye-hand coordination with tennis ability were not significant.

Barrow[4] and Rosemary have emphasized "the importance of balance and ability in various sports activity and their physiological mechanism. They have opinioned that balance is an important aspect of efficient motor response and is one of the basic motor

[3] Jean Panhonin, "A Study of Relationship of Selected Measures to Tennis Ability." Completed Research in Health, Physical Education and Recreation 9 (1967): p.88.
[4] Harold M. Barrow, P.E.D. and Rosemary MCGee, A Practical Approach to Measurement in Physical Education (Philadelphia: Lea dna Febiger, 1979);p.118-119.

factors. It is the ability of an individual to maintain his neuromuscular system in static condition for an efficient response on training control it in a specific efficient posture while it is moving. The first type of balance is static and the other is dynamic. Both are basic to movement under varying conditions. Both indicates a certain amount of steadiness and stability and characterized a certain amount of case and poise in maintaining position.

Black and Johnson[5] studied the effect of swimming training on reaction time of athletes who were non-swimmers. Result of this study indicated the reaction time of college athletes was improved during swimming instruction as compared to the control group.

[5] Judith P. Black and Dewayne J. Johnson, "Effect of Swimming Training on the Reaction Time of College Athletes." Abstract of Research Papers (1975):p.80.

Espenschade and Dable[6] conducted two studies of dynamic balance in adolescent boys.

It was found that dynamic balance is not related to height or weight but correlates substantially with the physical abilities important in physical education program.

Fifty Male subjects' ages thirteen and fourteen were tested by Carlyle[7] on their ability to balance on a stationary base and on a moving base. For each subject scores were recorded for each of 3 trials on each test. Analysis of the data revealed that for each test the gain between the trials 1 and 3 was significant. Ther's computed for all possible combinations of scores indicated that their was a marked relationship balance on a stationary base and balance on a moving base.

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[6] Anna Espenschade and Robert R. Dable, "Dynamic Balance in Adolescent Boys," Research Quarterly 24 (October 1953): p.270.

[7] Nolen Carlyle A. "A Study of Relationship between Balance on Stationary and Moving Ojbects," Completed Research in Health, Physical Education and Recreation (1969): 167.

Lotter[8] Investigated to determine the inter relationship among reaction time and speed of movement in different limbs. Two-movement basic to sports skills, modified baseball throws and football kicks were studied in 105 college athletes of various activities. This was only a moderately high correlation between the reaction time ability of right and left legs and between right and left arms. Arm verses legs correlation was significant but low. A similar pattern of correlation between limbs was found for movement specificity was high. The reliability of individual difference was high in all the measures.

Slatar and Hamel[9] undertook a study to compare reaction time measures to visual stimulus and arm movement. The purpose of the study was –

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[8] Willards S. Lotter, "Interrelationship among Reaction time and Speed of Movement in Different Limbs," Research Quarterly 31 (May 1960): 147.

[9] A.T. Slater Hammel, "Comparision of Reaction Time Measures to a Visual stimulus and Arm movement," Research Quarterly 26 (December 1995): p. 47.0

a) To compare reaction time measures for arm displacement and visual stimulus.

b) To compare reaction time measures for selected group of physical education measures and liberal art measures.

Analysis of the data revealed that only a modest relationship existed between the two reaction time existed among several group for both reaction measures.

Dixit[10] Investigated that interrelation of reaction time, speed of movements and agility and their comparison among players from selected sports. She studied 48 male college students i.e. 12 subjects from each selected sports (football, volleyball, kho-kho and kabaddi) from Lakshmibai National College of Physical Education, Gwalior).

[10] Poonam Dixit, "Inter-relationship of Reaction time, Speed of Movement and Agility and Their Comparison among the Players from Selected Sports," (Umpublished Master Thesis, Jiwaji University, 1982).

She found that agility and speed of movement were significantly related with either the speed on management on agility at 0.05 level of confidence.

Farrow[11] investigated motor performance variables for a sample population of professional baseball player, eight motor performance variables were selected as valid measure of components of professional baseball playing ability were defined as (1) running speed, (2) muscular power, (3) depth perception, (4) shoulder flexion strength, (5) throwing speed, (6) agility, (7) eye hand co-ordination, and (8) reaction time.

In addition the athletic motivational inventory which measures 13 personality traits were administered to each subject. 103 professional baseball players who trained in Florida during 1974 baseball season were selected as subjects. Statistical procedures used for

[11] James Carrol Farrow, "An Investigation of Selected Motor/Physical Performance Variables for a Sample Population of professional Basket Ball Players," Dissertation Abstracts International 36 (September 1975): p.1369-A.

analyzing the data were percentile rank, one way analysis of variance.

It was concluded that test battery of vertical jump, eye hand co-ordinations, Illinois's agility run, shoulder flexion strength, glace and bat tests, medicine ball put, 60 yard dash and throwing speed successfully differentiate between players classified on low minor leagues and those who are either high minor or overage league players, with significant difference in performance favouring the late two group.

On the basis of the study done by Meyers[12] on "retention of balance co-ordination learning as influenced by extended Lay" he took each of 5 groups of senior high school girls (N=20 per group) were initially given 10 trials on the Bachman Ladder Climb Task, and then given a different length of lay-off (10 minutes, or 1 day, or 1 week, or 4 weeks, or 13 weeks)

[12] Judith L. Meyers, "Retention of Balance Co-ordination Learning as Influenced by Extended Lay-offs," Research Quarterly 38 (March 1967):p. 72.

before being retested with another 10 trials. No significant loss in retention or credence of reminiscence or warm up decrement was formed across the lay-off periods.

Kerr[13] tested 47 male college students for speed of reaction time movement in a knee extension movement of 68^0. Each subject took 20 trials, the last 15 being only used for the analysis presented in this study. One week later 39 of the same parameters. In both tests reaction time was found to correlate with speed of movement (r=0.538 and 0.629). The two correlation coefficients were not found to be significantly different from each other.

Hodgkins[14] carried out a study on reaction time and speed of movement in males and females of

[13] Barry A. Kerr, "Relationship between Speed of Reaction Time and Movement in Knee Extension Movement," Research Quarterly 37 (March 1966): p.335.
[14] Jean Hodgkins, "Reaction Time and Speed of Movement in ales and Females of Various Age," Research Quarterly 34 (October 1963): p.335

various ages 930 men, women and children ranging in ages in their speed of reaction and movement time. The study revealed that a) males are faster than females both in reaction time and movement, b) speed of both functions increase up to early adulthood and then decreases, c) peak speed is maintained longer by males in movement and by females in reaction time, and d) in majority of groups studies no relation existed between speed of movement and speed of reaction.

Clair[15] divided 100 male students in 2 groups of 50 each athletes and non-athletes. The athletes consisted of 10 each basketball, gymnastic baseball, football players, lines men and football back 25 tests were administered to each subjects. The findings indicated that performance and agility test were accounted for the part, by reaction time, speed or movement, strength balance, change of direction and body size and from a

[15] Jannel W. Clair, "Introduction of Test for Agility," Completed Research in Health, Physical Education and Recreation (1060): p.44.

significant difference was found between the mear scores of the various group of athletes.

Atwell and Elbel[16] studied the voluntary or involuntary response of individuals to stimuli under various conditions. The study was conducted in an attempt to determine whether a significant difference in simple reaction time exists between age groups of male high school students. In this study 247 male high school students ranging in age from 14 to 17 years were used as subjects. They were divided into their respective age groups and tested individually by the same tests for speed of hand and body movement in response to stimulus. The data were presented in terms of mean scores for age group based upon 7 trials for each subject for hand response. The coefficients of correlation between hand and body response for each group were also calculated. It is seen that for the hand

[16] William O' Atwell and Edwin R. Elbel, "Reaction time of Male High School Students in 14-17 Years Age Gropups," Research Quarterly 19 (March 1948):p. 22-29

response, there is a more rapid responses with each successive age group. Also there is variation in response with increase in age.

A study was conducted by Espenchade[17] on development of motor co-ordination of boys and girls in 1947. she used Broce Test to find out the components of motor co-ordination such as agility, balance, flexibility body control and strength. The test was administered to boys and girls age ranging 13 and 17 years.

Beise[18] and Virginia pearly of university of Michigam took up a study of relation of reaction time speed and agility of the big muscles group to certain sports skill. Three groups were selected 1st was selected on the basis of demonstrated skill either tennis, golf or archery 24 players were selected, 2nd

[17] S. Anna Espenchade, "Development of Co-ordination in Boys and Girls," Research Quarterly 18 (March 1947): p.30-43.
[18] Dorthy Beise, "The Relationship of Reaction Time Speed and Agility of Big Muscles Groups to Certain Skills," Research Quarterly (1937): p. 451.

was selected in physical activities (those who failed to achieve average skills 14 subjects), 3rd was selected on those student who scored very low scores in Braces motor test. The group consisted of 6 low groups and 8 high groups, test was applied.

Result: These were significant difference in the result of skilled and non skilled players.

Mohr and Haverstic[19] studied 102 women students at the University of Maryland enrolled in eight week volleyball courses who were given repeated volleys test at 3ft. and 7ft., restraining lines. This height was measured and they were given tests for agility and vertical jumping. Correlations were computed between volleys test and other factors. From a study of these correlations and the significance of the differences a significant relationship was found to exist between jumping and volleying at the 3ft. distance.

[19] Dorothey R. Mohr and Mrtha J. Haverstic, "Relationship Between Height, Jumping Ability, and Agility to Volleyball Skills," Research Quarterly 27 (March 1956) p.74.

Burley and Anderson[20] found that power as measured by the jump reach test is closely associated with athletic success. They reported that power is more closely associated with track, swimming, basketball and baseball than with boxing and wresting, tennis and possibly football.

Jennet[21] found that performance or agility tests were accounted for in part by reaction time, speed of movement, strength, balance, change of position, change of direction, and body size and from. A significant difference was found between several mean factors scores of the athlete and non-athlete groups but no significant differences was found between the mean factor scores for the various groups of athletes.

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[20] Lioyd R. Burley and Roylenard Anderson Jr., "Relatinship of Jump and Reach Measures of Power to Intelligence Scores and Athletic Performance," Research Quarterly 26 (March 1955): p.28-35.

[21] Clair W. Jennet, An Investigation of Tests of Agility," Completed Research in Health, Physical Education and Recreation 2(1960):p. 44.

Burke[22] examined the effect of stimulus condition and direction on reaction time and movement time of closed and open skill athletes. The stimulus condition were simple as well as complex. The direction of movement were to the front, the left, the right and to the near. 42 closed athletes were gymnasts, cross country runners and swimmers, while the 42 open athletes were soccer, baseball and basketball players. A significant interaction was achieved, between the stimulus condition and direction.

And the following conclusions were made.

1. Reaction time and movement time measures were faster under complex stimulus conditions.

2. The open skill athletes had faster reaction time movement time measures than the closed skill athletes.

[22] Thomas Richard Burke, "Effect of Stimulus Condition and Direction on Reaction Time Movement Time of Closed and Open Skill Athletes," Dissertation Abstract International (1972): p.2249.

Manilal, Sabastian and Thomas[23] conducted a study to compare the coordinative abilities of junior India Basketball players and Junior Indian Volleyball players. Twenty-one girls who has attended the Junior Indian Volleyball coaching camp were selected as subjects. For coordinative ability test suggested by Peter Hirtz were administered to evaluate the coordinative abilities of the subjects. The 't' test was employed to determine the mean difference in different coordinative abilities between volleyball and basketball female players. The result also showed that the volleyball players have better space orientation ability and reaction ability than the basketball players.

Baskshi[24] Conducted a study on 2 groups of sports persons on coordinative abilities. The two groups were the track and field athletes and swimmers. These

[23] K.P. Manilal,; P.J. Sabstian and Raju Thomas, "Comparison of Coordinative Abilities of Junior Indian Basketball and Volleyball Female Players," (Unpublished Research Report, NSNIS, Bangalore, 1990).

[24] Reema Bakshi, "Companion of Two Group in Coordinative Abilities", (Unpublished Master's Thesis, Jiwaji University, 1994).

groups were chosen because both the activities involved cycle type of movements. They were tested on the activities test on suggested by Peter Hirtz. The subject chosen were either of level of inter- collegiate level or of inter-university level.

Another observed the test revealed that there is no significant difference in coordinative abilities of swimmers and track & field athletes.

Gouranga[25] Saskar tested the relationship of co-coordinative abilities to shooting performance in soccer on 25 male football players. The findings reveal that there were no significant relationships of the coordinative abilities to shooting performance in soccer.

The findings were, there is no significant relationship between shooting performance and coordinative abilities of footballer.

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[25] **Gouranga Saskar,** "Relationship of coordinative abilities to shooting performance in Soccer" (Unpublished Master Degree Thesis in L.N.I.P.E. 1999)

Archita[26] Koley conducted a study on relationship of coordinative abilities to sprinting performance in sprinters. The result of the study shows that, the reaction ability, orientation ability and balance ability had significant relationship to sprinting performance.

[26] Archita Koley, "Relationship of coordinative abilities to sprinting performance in sprinter's" (Unpublished Master Degree Thesis, L.N.I.P.E. April 1999).

Chapter III

PROCEDURE

In this chapter the selection of subject, selection of variables, reliability of data, tester's competency, subject's reliability, collection of data, administration of test and statistical technique employed for analyzing the data are described.

Selection of Subjects

For the purpose of the study 12 Badminton players, of the Lakshmibai National Institute of Physical Education, Gwalior, were selected subjects.

The subjects were thoroughly acquainted with the testing procedure as well as the purpose and significance of the study. A thorough orientation of requirements during the testing procedures and performance test were made for successful completion of study. The selected sample consist of 12 players

were requested by the scholar to cooperate and to participate with utmost sincerity. Everything regarding the tests were made clear and finally requested to participate whole heartedly in the present study.

Selection of Variables

On the basis of available literature in the coordinative abilities and their tests the following coordinative abilities wee selected for this study.

1. Orientation ability measured by numbered medicine ball run test and was measured in 1/10 of seconds.
2. Differentiation ability Determined through backward medicine ball throw test and was measured in accordance with point scored by each subjects.
3. Reaction ability measured by ball reaction exercise test and was measured in meter and centimeters.

4. Balance ability measured by long nose tests and was measured in meter and centimeters.

5. Rhythm ability Assessed by sprint at given rhythm test[1] and was measured in seconds.

Reliability of Data

The reliability of data was ensured by establishing the instrument's reliability, tester's competency, tests and subjects reliability.

Instrument's Reliability

The stop watches used for measuring the performance of subjects in reaction, orientation, balance and rhythm abilities were obtained from well known standard firms which supply to various research laboratories in India and abroad.

[1] Peter Hirtz, Coordinative Faclizbeiten Schoisport, P. 127

All the medicine ball used for the test were checked and weighed to ensure that they were of the required standard.

The wooden planks taken for administering the reaction ability test were measured, using a calibrated steel tape to ensure the required length and width.

All these equipments were available at the Research Laboratory and sports store of Lakshmibai National Institute of Physical Education, Gwalior and their calibration were accepted as accurate enough for the purpose of this study.

Tester's Competency and Reliability of Tests

To ensure that the scholar was well versed with techniques of conducting the tests, the scholar had a number of trial practice sessions in testing procedure under the guidance of experts at Lakshmibai National Institute of Physical Education, Gwalior.

Tester's competency was established by test retest method whereas consistency of result was obtained by product moment correlation. The data collected from a random selection of 12 subjects by test-retest process were computed for each variable and are presented in Table 1.

TABLE -1

RELIABILITY COEFFICIENTS OF TEST-RETEST SCORES

S.No.	Test Item	Coefficient of Correlation 'r'
1.	Orientation Ability	.92*
2.	Reaction Ability	.84*
3.	Differentiation Ability	.95*
4.	Balance Ability	.93*
5.	Rhythm Ability	.93*

* Significant at.01 level.

N = 12

r.01 (10=.71)

Subjects Reliability

The above test-retest coefficient of correlation method also established subjects were used under similar conditions by the same tester.

Administration of Tests and Collection of Data

The necessary data was collected by administering various coordinative ability tests as suggested by Peter Hirtz.[2] The entire five tests were administered to the subjects at the basketball courts of Lakshmibai National Institute of Physical Education, Gwalior.

The necessary markings were done before the start of the test and the scholar strictly followed the specification as mentioned in the test. The entire test were demonstrated and explained to the subjects by the scholar. They were given a chance to practice and become familiar with the tests and to know exactly what

[2] Peter Hirtz Ed; Koordinative Fachigkeltes in Schulsport (Volk and Wissen Volk scigener verlag, Berlin, 1985), p. 152.

was to be done. There was no time limit in performing the tests but, the subjects were requested to put in their maximum effort.

Numbered Medicine Ball Run Test

Objective of the Tests:

To determine orientation ability of the subjects.

Equipments:-

1. Five medicine balls each weighing 3 kgs.
2. One medicine ball weighing 4 kgs.
3. Stop watch.
4. Caliper.
5. Pencil, Papers and Pads.

Description:-

All the medicine ball weighing 3 kgs were arranged as shown in Fig. 1 on an even ground in a semi circle with a distance of 1.5 m. between the balls. The subjects medicine ball weighing 4 kgs was kept 3 m.

away from these medicine balls. Behind all the medicine balls of 3 kg. weight, metallic number plates of 1 sq. foot size were kept, from 1 to 5. Before the start of the test the subjects were asked to stand behind the sixth medicine ball facing toward the opposite direction. On signal the subjects turned and ran towards the number called by the tester and touched the medicine ball and run back to touch the sixth medicine ball, immediately another number was called. Similarly, a total of three times the number was called by the tester and the subjects performed accordingly. Before the actual test was administered, one practice trial was given to all the subjects.

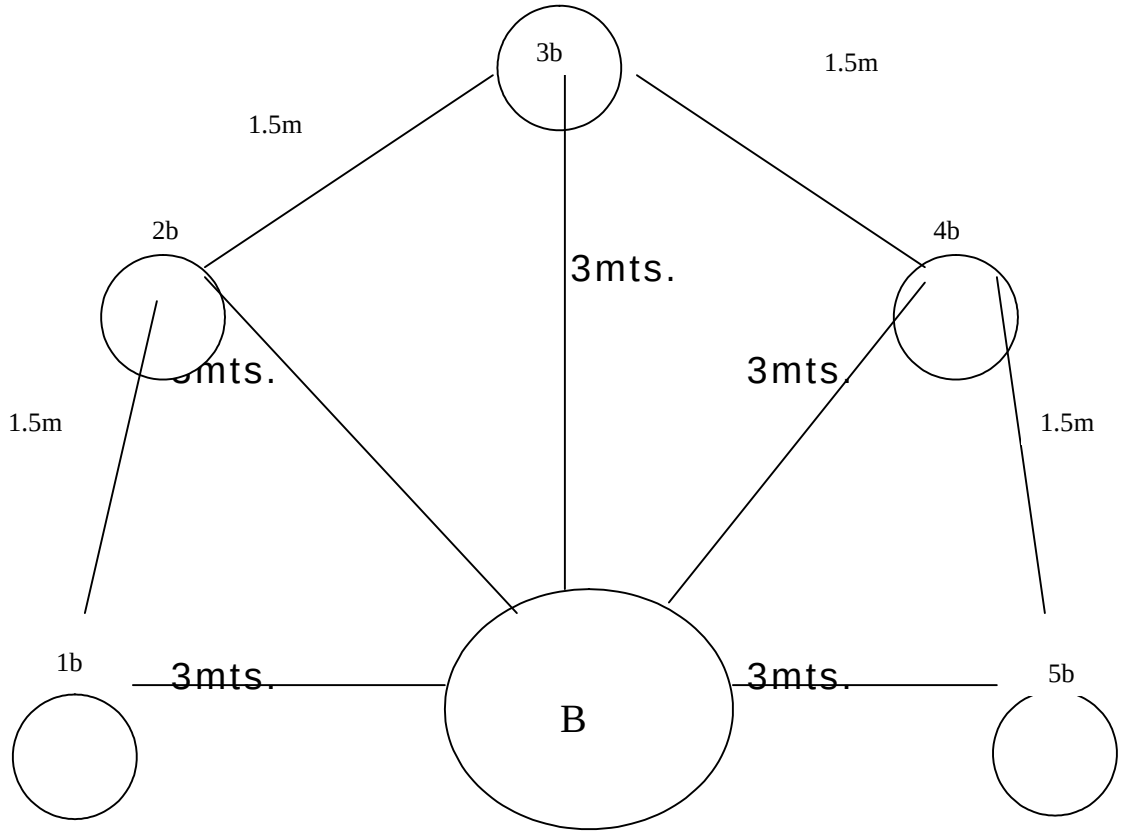
Scoring:-

The time taken to complete the course was noted in seconds. Two trials were given to each subject and the better one was recorded as score. The score obtained in seconds are presented in Table No. 2

TABLE -2

Raw scores of Orientation ability (in seconds)

Name	First Time	Second Time
Ajay	8.20	8.30
Kuhwar	6.95	6.90
Kishan	8.00	7.20
Amar	6.50	7.10
Rakesh	9.00	8.10
Yajuvendra	7.90	6.10
Dorjee	8.30	9.00
Satyendra	7.80	6.60
Aman	9.00	6.80
Gyanendra	7.20	7.35
Mani	8.10	8.15
Sanjeev	8.18	8.14



B – Medicine Ball Weighing 4 Kg.

b – Medicine Ball Weighing 3 Kg.

Fig. – 1

ORIENTATION ABILITY TEST

Backward Medicine Ball Throw Test

The test was administered to assess the differentiation ability of the subjects.

Equipments:-

1. A gymnastic mat, size 3x6.
2. One medicine ball weighing 2 kgs.
3. Five medicine balls weighing 1 kg. each,
4. Pencil, papers and pad.

Description:-

A gymnastic mat was kept 2m. away from the starting line as shown in Fig. 2. A circle of 40 cm. radius was drawn in the middle of the mat and a medicine ball of 2 kgs. Kept at the center of the circle. The subjects were asked to stand behind the starting line facing the opposite direction. They were asked to throw five medicine balls (1kg) over the head to hit the 2 kgs ball kept on the mat, one after another by using

both the hands. One practice trial was given to all the subjects.

Instructions:-

1. One overhead throw was permitted.
2. The students were not allowed to look back.

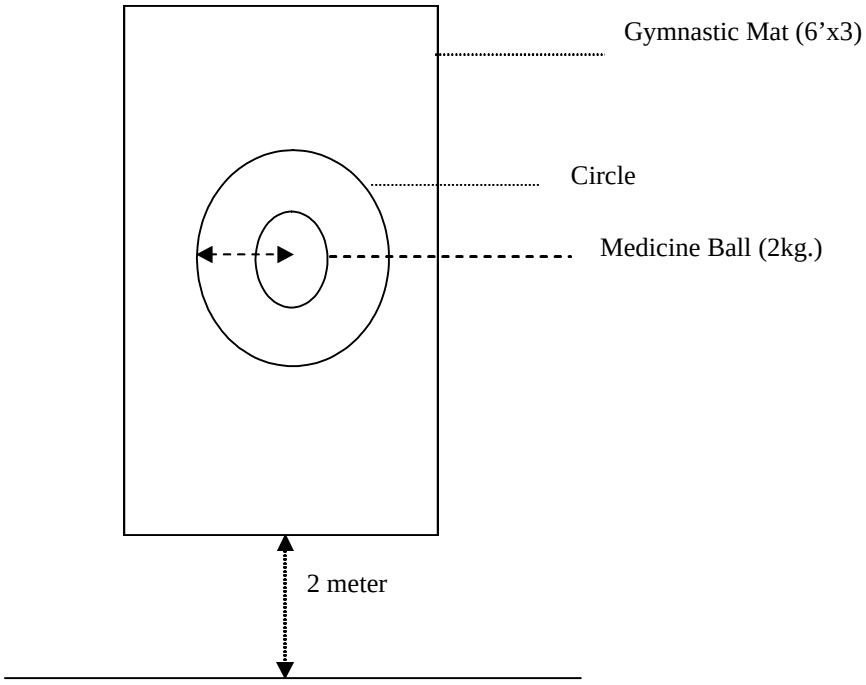


Fig. –2

DIFFERENTIATION ABILITY TEST

TABLE- 3

The raw scores of Differentiation ability(in points)

Name	First Time	Second Time
Ajay	18	14
Kuhwar	17	18
Kishan	15	10
Amar	10	9
Rakesh	10	11
Yajuvendra	9	7
Dorjee	17	11
Satyendra	15	9
Aman	8	11
Gyanendra	18	10
Mani	5	10
Sanjeev	14	15

Scoring;

Medicine ball touching the mat = 1 pt.

Medicine ball touching the circle line = 2pts.

Medicine ball inside the circle = 3 pts.

Medicine ball touching the ball (2kg medicine ball kept at the center of the circle) = 4 pts.

Points were decided considering the 1st pitch of the ball. The score of the individuals was the total points scored in all the five throws. The score are presented in Table-3

Ball Reaction Exercise Test

Objective:-

This test was administered to measure the reaction ability of the subjects.

Equipments:-

1. Two wooden planks each of 4 m. length.
2. One inflated Volleyball.
3. A supporting stand.
4. Pencil, Papers and Pad.

Description:-

Two wooden planks of four meters each kept inclined by a supporting stand having a height of one meter and twenty centimeters as shown in Fig. 3. so that it could enable a volleyball to roll freely form a height of 1.20 m. the lower ends of wooden planks were kept at a distance of 1.5 m. away from the starting line outer side of one of the plank was graduated in centimeters. Volleyball was held by the tester at the top of the plank. The subjects were asked to stand behind the starting line, facing of opposite to the plank.

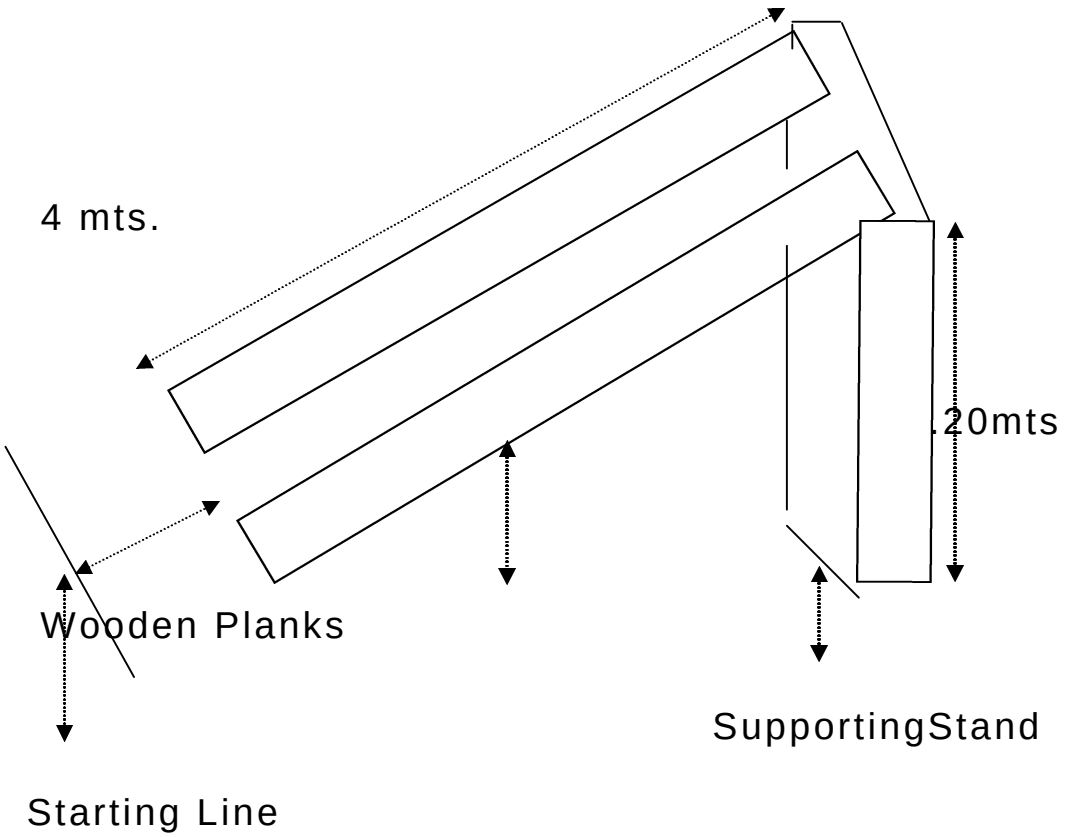


Fig.-3

REACTION ABILITY TEST

On clapping, the subject took a turn and ran towards the planks and stopped the ball with both the hands which was dropped on the signal. Each subject was given a practice trail befor actual commencement of the test.

Instructions:-

1. The ball should be stoped with both hands.
2. The ball should not be pushed upward while stopping.

Scoring:-

The score was the distance measured in cms. From the top of the planks to a point where the subject stopped the ball. Only two trials were given and the best one was recorded as the score of the subject. The score measured is presented in Table-4

TABLE -4

The raw scores of Reaction ability (in seconds)

Name	First Time	Second Time
Ajay	1.40	1.55
Kuhwar	1.95	1.90
Kishan	1.90	1.85
Amar	1.80	1.65
Rakesh	1.50	1.55
Yajuvendra	1.95	2.00
Dorjee	1.65	1.60
Satyendra	1.80	1.70
Aman	1.80	1.85
Gyanendra	1.40	1.20
Mani	1.95	1.90
Sanjeev	2.00	1.70

Long Nose Test

Objective:-

The test was administered to measure the balance ability of the subjects.

Equipments:-

1. Balancing beam.
2. One medicine ball weighing 2 kg.
3. One medicine ball weighing 1kg.
4. Stop watch.
5. Pencil, papers and pad.

Description:-

A balancing beam of standard size was kept on the floor, one and half meter away from the starting line as shown in Fig. 4. The subject was asked to stand behind the starting line with one kg. Medicine ball on his strong hand fully stretched forward and the other hand holding the opposite ear labe. On clapping, the subject moved over the balancing beam towards the 2 kg.

medicine ball which was kept at the other end of the beam, pushed down the medicine ball with any of back to the starting line without losing the balance. Each subject was given only one chance.

Instructions:-

1. The arm with which the ball is carried should be kept straight.
2. The medicine ball kept on the balancing beam should be rolled down with either foot.

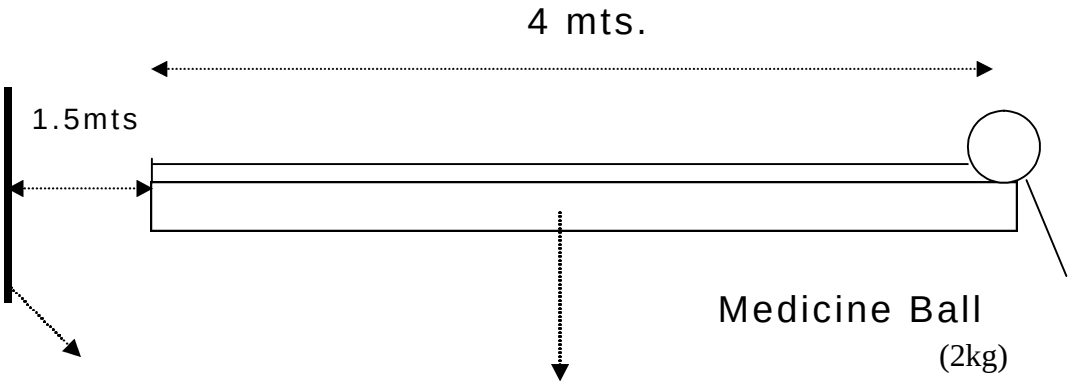


Fig. 4

BALANCING ABILITY TEST

Scoring:-

The time taken is seconds to complete the course was taken as the score. At the lane time the subjects who failed to complete the task were not given further trial and no score was awarded. The score of balance ability is presented in Table-5

TABLE – 5

The raw scores of Balance ability;

Name	First Time
Ajay	7.30
Kuhwar	7.65
Kishan	7.80
Amar	8.56
Rakesh	9.35
Yajuvendra	6.35
Dorjee	11.5
Satyendra	6.55
Aman	7.30
Gyanendra	8.00
Mani	8.65
Sanjeev	9.00

Sprint of Given Rhythm

Objective:-

The test was administered to determine the rhythm ability of the subjects.

Equipments:-

1. Eleven gymnastic hoops each 1m. in diameter.
2. One stop watch.
3. One measuring tape.

Description:-

The subject had to run a distance of 30m. with maximum sprinting speed marked between two lines. The sprinting time of the subject was taken by stop watch. In the second attempt the subject had to run at a particular rhythm with maximum speed through eleven hoops which were arranged systematically as show in Fig. 5. Three hoops were kept in a sequence adjacent to each other at a distance of 5m. away from the

starting line. Similarly three hoops were kept at a distance of 5m. from finishing line. Five more hoops were kept in a sequence in the middle of the running distance. The subject had to run through these hoops stepping between each of them adjusting to the new self-rhythm. The research scholar explained the test along with one demonstration and each subject was given one trial run.

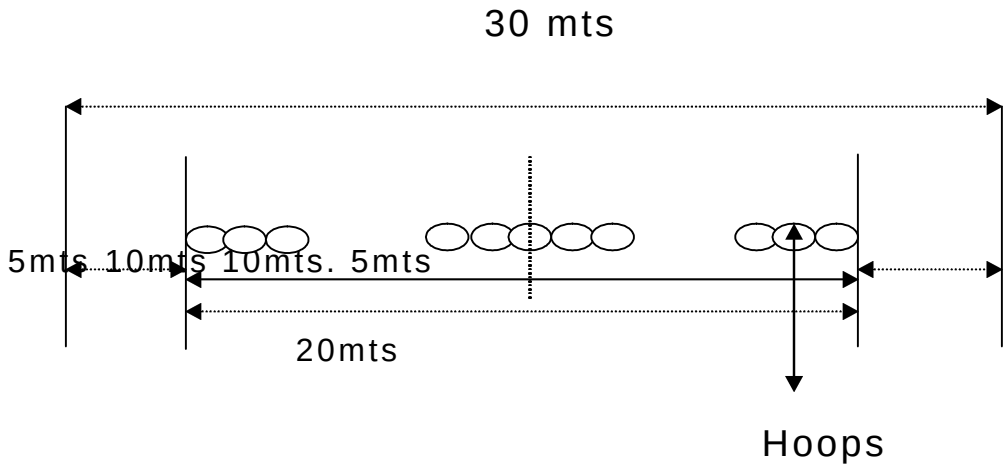


FIG- 5

RHYTHM ABILITY TEST

Scoring:-

The difference between the timings of 1st and 2nd attempt was taken as the score and are presented in Table-6

TABLE - 6

The raw scores of Rhythm ability (in seconds)

Name	First Time	Second Time
Ajay	.64	.80
Kuhwar	.80	.76
Kishan	.85	.81
Amar	.60	.57
Rakesh	.65	.61
Yajuvendra	.96	.97
Dorjee	1.10	.99
Satyendra	.66	.54
Aman	.58	.45
Gyanendra	.28	.50
Mani	.38	.33
Sanjeev	1.10	.95

Performance Test

Scholar after conducting different coordinative ability tests, once again assembled all the subjects for conducting their performance test. The necessary data was collected by administering Bobrich Badminton observational rating scale.[3] As Bobrich Badminton observation and suggest a simple doubles match was played between selected subjects and same time three judges were appointed to judge their performance in the game.

So after assembling all the subjects further instructions were given and subjects were asked to play their natural game.

Scores can range from 0 to 27 on Section I and from 0 to 16 on Section II. A 20 minute time period was needed for evaluator to rate 4 students engaged in doubles match.

[3] Harold M. Barrow & Rosemary McGEE, "A Practical Approach to Measurement in Physical Education" Third Edition 1979.(Bobrich Badminton Observational Rating Scale, Master's Thesis, George William College, 1972). P.224-228.

Below are listed criteria which were used when evaluating individuals as they participated in doubles badminton games.

Section I deals with 9 Skills, and section II is composed of 8 Items dealing with playing Strategies and General knowledge. Participants were observed and were rated according to the appropriate scale herein provided. A score was based on consistency in form and execution, rather than the frequency of items or skills. The rating scale was worded for right-handed players.

Section I – Skills

The rating scale ranges from 0 to 3 points on each item in this section.

Long Serve

0 Points – Skill not observed or not attempted.

1 Point - Awarded for fair ability if the shuttle height is medium or low; if there is no direction of the shuttle to

the opposite court; or if the shuttle falls out of bounds or close to the short service line of the opposite court.

2 Points- Awarded for good ability if the shuttle is hit to travel high and lands in the middle of the opposite service court.

3 Points- Awarded for excellent ability if the shuttle is hit to travel high and deep to land on the back service line or is directed to land in either corner of the opposite service court.

Long Serve Return

0 Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the attempt made show slow footwork in a backward direction causing the body to become off balance and result in a poor return or a failure of the shuttle to cross the net.

2 Points – Awarded for good ability if quick footwork is used in moving backward; some body balance is

observed as the shuttle is successfully returned over the net.

3 Points- Awarded for excellent ability if the receiver uses quick footwork in moving backward to get behind the shuttle; body balance is in good control; and the shuttle is returned by any overhead stroke, preferably the smash.

Short Serve

0 Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the shuttle is hit more than 3 feet over the top of the net, lands more than 4 feet beyond the front service line, or lands out of bounds.

2 Points – Awarded for good ability if the shuttle is hit to cross the net within 1 to 3 feet over the top of the net and lands within 4 feet of the front service line.

3 Points – Awarded for excellent ability if the shuttle is hit to skim the top of the net, loses height immediately,

and lands along the front service line or near the corner of the opposite service court.

Short Serve Return

O Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the shuttle is returned out of bounds, or in the attempt to return the shuttle the footwork is slow, causing the body to become off balance, resulting in a poor return.

2 Points – Awarded for good ability if the receiver moves forward to meet the shuttle and successfully returns it into the opponent's court.

3 Points – Awarded for excellent ability if the body is aligned so that contact with the shuttle is made overhead with a full swing, and the return is high into the opponent's backcourt landing just inside the baseline.

Smash

0 Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the body is off balance, no wrist snap is present, or the shuttle is hit over the net as in any return with no aim or direction present.

2 Points – Awarded for good ability if the body is aligned with the oncoming shuttle; or contact is made but the wrist snap is weak and the shuttle is moved downward without the necessary speed for a successful stroke.

3 Points – Awarded for excellent ability if the body is aligned with the oncoming shuttle so that contact is made high and on top of the shuttle; there is a definite wrist snap at point of contact so that shuttle is forced downward with great speed aimed at opponent's body, his left side, to baseline, or to sidelines.

Lob

0 Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the body is not aligned with the oncoming shuttle, the swing is not executed as a forehand stroke, or a fault is committed.

2 Points – Awarded for good ability if the body is aligned with the oncoming shuttle, but the swing is partial and not directed upward.

3 Points – Awarded for excellent ability if the receiver moved forward to meet the shuttle in front of and to the right of the body, and there is a slow full forehand swing from down to up directed to land in the opponent's mid-court.

Backhand Drive

0 Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the body is not in line with the oncoming shuttle, the racket swing is performed more with the wrist than a full swing from the shoulder, the body weight is off balance, or body weight is not transferred on the follow-through.

2 Points – Awarded for good ability if contact with the shuttle is made on the left side of the body, the racket swing is not parallel to the floor but is angled upward carrying the shuttle over the net, or the transfer of weight on the follow-through is slight.

3 Points – Awarded for excellent ability if the body is aligned with the shuttle so contact is made on the left side of the body, the racket swing is straight sideward with a good wrist snap and is low, causing the shuttle to travel quickly straight forward just clearing the net, and there is a definite transfer of weight on the follow-through.

Drop

0 Points – Skill not observed or not attempted.

1 Point – Awarded for fair ability if the body is not aligned with the shuttle for proper execution of the stroke, a forward drive is used instead of an overhead stroke, or the shuttle does not fall in bounds.

2 Points – Awarded for good quality if the body is aligned with the shuttle for contact overhead but is hit behind the short-service line with either too much are or too much speed.

3 Points – Awarded for excellent ability if the body is aligned with the shuttle so contact is made in front of the body, the shuttle is “patted” down so it falls in a steeps angle just over the net in front of the short-service line, and the swing is overhead but slow so as to deceive the opponent.

Section II – Strategies and Knowledge

The rating scale ranges from 0 to 2 points on each item in this section. Zero indicates that the item is never attempted, 1 indicates that the item is sometimes attempted, and 2 indicates that the item is always attempted.

Playing Strategies

1. Student moves to meet the oncoming shuttle.

2. Student plays the shuttle to the opponent's corners.
3. Students aims the shuttle to the opponent's backhand side.
4. Student play aggressively.

General Knowledge

1. Student calls score and service.
2. Student displays etiquette on the court.
3. Student demonstrates knowledge of game rules.
4. Student displays sportsmanlike attitude on court.

Score:

The means of the points awarded by the three judges on the basis of the performance the subjects is calculated for determining the ranking of subject and presented in Table-7

TABLE - 7

The raw scores of Performance test with Ranking;

Name	First Judge	Second Judge	Third Judge	Ranking
Ajay	7	10	7	9
Kuhwar	9	7	8	10
Kishan	12	9	12	5
Amar	16	14	15	1
Rakesh	9	8	4	12
Yajuvendra	11	10	12	6
Dorjee	12	13	11	4
Satyendra	9	7	8	11
Aman	10	9	11	7
Gyanendra	12	13	17	2
Mani	10	10	10	8
Sanjeev	12	11	13	3

Statistical Analysis

For analyzing the result of the study the Rank order correlation (coefficient of correlation) method was employed. The scores of all the abilities and performance were correlated for analyzing the data/scores.

For testing the hypothesis the level of significance was set at.05 level of confidence.

Chapter IV

ANALYSIS OF DATA AND RESULTS OF THE STUDY

In this chapter the statistical analysis of data, results of the study and discussion of findings have been presented.

Statistical Analysis of Data

The statistical analysis of data of selected coordinative abilities collected on 12 Badminton players.

The coordinative tests were conducted on all the subjects. The orientation, balance and rhythm ability were recorded to the nearest 1/10th of a second. The differentiation ability was recorded in accordance with the points scored by each subject whereas the reaction ability was recorded to the nearest cm performance test

was also conducted and scores were assigned to the subjects on the basis of the performance level.

To find out the significant relationship between each selected abilities separately and compositively in relation to the performance of selected Badminton players co-efficient of correlation technique was employed and for testing the significance the level of significance was set at.05 level which was considered appropriate because the research process adopted didn’t involved rightly sophisticated equipment demanding the application of more stringent level of significance.

TABLE - 8

Spearmen Rank order co-relation of performance in Badminton in relation to orientation ability.

Orientation Ability	Performance Ranking
8.20	10
6.90	10
7.20	5.5
6.50	1
8.10	12
6.10	5.5
8.30	3.5
6.60	10
6.80	7.5
7.20	2
8.10	7.5
8.14	3.5

r = 0.099

TABLE - 9

Spearmen Rank order co-relation of performance in Badminton in relation to Differentiation Ability.

Differentiation Ability	Performance Ranking
14	10
17	10
10	5.5
9	1
10	12
7	5.5
11	3.5
9	10
8	7.5
10	2
5	7.5
14	3.5

r = -0.069

TABLE - 10

Spearmen Rank order co-relation of performance in Badminton in relation to Reaction ability.

Reaction Ability	Performance Ranking
1.40	10
1.90	10
1.85	5.5
1.65	1
1.50	12
1.95	5.5
1.60	3.5
1.70	10
1.80	7.5
1.20	2
1.90	7.5
1.70	3.5

r = 0.134

TABLE - 11

Spearmen Rank order co-relation of performance in Badminton in relation to Balance ability.

Balance Ability	Performance Ranking
7.30	10
7.65	10
7.80	5.5
8.56	1
9.35	12
6.35	5.5
11.5	3.5
6.55	10
7.30	7.5
8.0	2
8.65	7.5
9.0	3.5

r = -0256

TABLE - 12

Spearmen Rank order co-relation of performance in Badminton in relation to Rhythm ability.

Rhythm Ability	Performance Ranking
.64	10
.76	10
.81	5.5
.57	1
.61	12
.96	5.5
.99	3.5
.54	10
.45	7.5
.28	2
.33	7.5
.85	3.5

r = -0.036

TABLE-13

Spearmen Rank order co-relation of performance in Badminton in relation to Composite Coordination ability.

Compositive Score of Coordinative Ranking	Performance Ranking	Ranking of Compositive Score	D	D^2
26	10	4	6	36
25.5	10	3	7	21
36.5	5.5	9	-3.5	12.25
28.5	1	5.5	-4.5	20.25
34.5	12	7	5	25
36	5.5	8	-2.5	6.25
44	3.5	12	-8.5	72.25
24	10	2	8	64
28.5	7.5	5.5	2	4
21.5	2	1	1	1
42	7.5	11	-3.5	12.25
39	3.5	10	-6.5	42.25

r = -0.204

Findings

In order to find out the relationship between the coordinative abilities and performance in Badminton, the collected data was calculated by using co-efficient of correlation. The results of statistical technique used on data are presented in Table 14.

TABLE - 14

RELATIONSHIP OF COORDINATIVE ABILITIES TO PERFORMANCE IN BADMINTON

S.No.	Coordinative Abilities	Co-efficient of Correlation 'r'
1.	Orientation ability	0.099
2.	Differentiation ability	-0.069
3.	Reaction ability	0.134
4.	Balance ability	-0.256
5.	Rhythm ability	-0.036

Significant at.05 level

r.05 (10) = 0.576

In the Orientation ability, it is evident from (Table-8) that the result obtained was insignificant as the calculated value (0.099) was less than the table value (0.576) at.5 level of confidence with 10 df.

In the case of Differentiation ability (Table-9) the similar result was obtained as the calculated value (-0.069) was less than the table value (0.576) at.05 level of confidence with 10 df.

In the case of Reaction ability (Table-10) result obtained was insignificant as the calculated value (0.134) was less than the Table value (0.576) at 0.05 level of confidence with 10df.

In the case of Balance ability (Table-11) result obtained was insignificant as the calculated value (-0.256) was less than the table value (0.576) at.05 level of confidence with 10 df.

In the case of Rhythm ability (Table-12) result obtained was insignificant as the calculated value (-0.036) was less than the table value (0.576) at 0.05 level of confidence with 10 df.

At last the composite Co-ordination ability was obtained. The calculated value 0.204 was obtained,

which was also insignificant than the Table value (0.576) at 0.05 level of confidence with 10 df.

Discussion of Findings

Finding of the present study showed that there was no significant relationship between the selected coordinative abilities and Badminton performance. All the selected coordinative abilities i.e. orientation ability, differentiation ability, reaction ability, balance ability and rhythm ability obtained values after statistically analyzing the data, it was found that none of calculated value was higher than required table value at.05 level with 10 df. Following values were found after analyzing Orientation ability (0.099), Differentiation ability (-0.069), Reaction ability (0.134), Balance ability (-0.256), Rhythm ability (-0.036) and composite co-ordination ability (0.204) which were less than required value at.05 level of confidence i.e. (0.576).

After seeing all the findings it was clearly indicated that there are no significant or positive relationship between selected abilities and Badminton performance. None of the selected ability showed significant relationship which could be described as an important difference or characteristics in Badminton players and their level of performance of these selected coordinative abilities to the performance in Badminton. It could happen that some other coordinative abilities which were not taken in this present study might have their relationship to the Badminton performance.

In the post studies conducted by some other scholars also support the findings of present study because they were also having no relationship. But at same time the findings of same studies also disagree with the findings and having a significant relationship between selected abilities and performance.

Discussion of Hypothesis

On the basis of the results of the study, the hypothesis stated that there will not be a significant relationship between the selected coordinative abilities to the performance in Badminton, is accepted at.05 level of significance.

Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIOS

Summary

The purpose of the study was to investigate the relationship of selected coordinative abilities to the performance in Badminton.

Twelve Badminton players the subjects selected were the students of the Institute and studying in B.P.E. and M.P.E. Course. The necessary data for analyzing the relationship was collected by administrating various coordinative ability tests as suggested by Peter Hirtz. Mainly five selected coordinative abilities namely – Orientation ability, Differentiation ability, Reaction ability, Balance ability and Rhythm ability were taken for this study. Apart from coordinative abilities, a performance test was also conducted by the scholar and according to the level of performance each player out of 12 subjects were

assigned the scored out of 20 and ranking was given accordingly.

Further the data were analyzed to find out the significant relationship between these abilities and Badminton performance. Co-efficient of correlation (Statistical Technique) was used/employed to analyze the relationship and the level of significance was set at.05 level for testing the hypothesis.

Conclusion

On the basis of result obtained from the study, following conclusion were drawn:

1. There was no significant relationship was found between selected coordinative abilities and performance in Badminton, independently or as a whole.
2. This study also indicated that development of different selected coordinative abilities may not

be considered as an essential factor to achieve the best performance by Badminton players.

3. Further it can also be concluded that minimum level of fine coordinative abilities might be enough for the performance in Badminton.

Recommendations

In the light of conclusions drown, following recommendations may be made:

1. The same study can also be conducted on a large number of samples.
2. Similar study may be repeated on National and International level of Badminton players.
3. Same other studies can be taken in other disciplines (games and sports) also.

4. It is also recommended that a similar study may be carried out by involving anthropometrical, physiological, and sociological variables. To further investigate the relationship of coordinative abilities to other required components.
5. The same study can also be conducted on female badminton players to find out the relationship.

APPENDIX

RAW SCORES OF BADMINTON PLAYERS

Scores of Coordinative Abilities

S.No.	Orientation Ability	Differen-tiation Ability	Reaction Ability	Balance Ability	Rhythm Ability	Perfor-mance Test
1.	8.20	14	1.40	7.30	.64	8
2.	6.90	17	1.90	7.65	.76	8
3.	7.20	10	1.85	7.80	.81	11
4.	6.50	09	1.65	8.56	.57	15
5.	8.10	10	1.50	9.35	.61	7
6.	6.10	7	1.95	6.35	.96	11
7.	8.30	11	1.60	11.5	.99	12
8.	6.60	9	1.70	6.55	.54	8
9.	6.80	8	1.80	7.30	.45	10
10.	7.20	10	1.20	8.0	.28	14
11	8.10	5	1.90	8.65	.33	10
12	8.14	14	1.70	9.0	.95	12

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