Chapter II

REVIEW OF RELATED LITERATURE

Crauston\textsuperscript{1} studied the relationship of reaction time and movement time and visual tracing to performance in Badminton. A reaction time movement time device, a pursuit motor and miller Badminton wall Volley test were used to collect data on college women. Reaction time, movement time and visual tracking had no apparent had relationship to performance in Badminton.

Stanley\textsuperscript{2} studied the influence of figure perception gross reaction time, movement time and total movement response upon the ability to strike a moving object with a racket. Ninety college women were divided into three groups. An original total movement response test and original striking skill test were conducted for all. The finding showed that the striking ball

\textsuperscript{1} Verginia Aglus Crauston "An study of relationship of Reaction time, moment time and visual tracking to performance in Badminton" \textbf{Complete Research in Health, Physical Education and Recreation}, 10(1968) : 95

\textsuperscript{2} Phillip Lee Stanley, "Influence of Figure Ground perception and Selected Movement Variables in Racket Type Striking Skill," \textbf{Dissertation Abstracts International} 33 (October 1972) : 1496-A.
was not influenced by figure ground perception nor it influenced gross reaction time movement time and total movement response. The striking skill of the subjects were influenced by their gross reaction time, movement time and total movement response.

Galt\textsuperscript{3} studied college women chosen on the basis of activity choice within the required general programme of physical education and were tested on reaction time, movement time device and on a pursuit rotor. Test reliabilities for reaction time, movement time, visual tracking ability were .87, .94 respectively. There were no difference in reaction time, movement time of participants in team sports, participating than dances. There were no difference in visual tracking ability between team and individual sports participants on between individual sports participants and dances.

Christofel⁴ studied the inter-relationships of performance of selected sports skills, reaction time, speed of movement time and intelligence of high school girls. The statistical analysis of this study was based on the scores made by 104 girls at Berea High School, Ohio, in 1957-58. Of 18 correlations determined, four were significant. Two negative correlations were found when the reaction time scores were correlated with the speed of movement time scores of all subjects and those of subjects in the bottom 20 percent of the group. The coefficients, -.26 and -.56, were significant at .01 level of confidence and were indicative of a negative relationship between the two variables as measured in this study. The two positive correlations were found when the speed of movement time scores were correlated with the performance scores made by all subjects and those made by subjects in the top 20 percent of the group. The coefficients obtained were .43 and .50 respectively. The coefficient of .43 was significant at .01 level for 102 degrees of

freedom, and the coefficient of .50 was significant at .05 level with 19 degrees of freedom. The coefficients suggested that the speed of movement time and performance as measured in this study were significantly related.

Wilkinson\(^5\) conducted a study of reaction time measures to a kinesthetic and a visual stimulus for selected groups of athletes and non-athletes. The subjects were 50 non-athletes and 100 varsity athletes, the athletes were divided into four equal groups of wrestlers, baseball players, football players, and basketball players. In the completion of a kinesthetic response, the sudden displacement of the subject's supported arm served as the stimulus, and the lighting of a neon glow lamp constituted the visual stimulus. It was observed that the Reaction Time to a kinesthetic stimulus was significantly faster than reaction time to a visual stimulus. The athletes had significantly faster reactions in both reaction-time measures than non-athletes. Wrestlers had significantly faster

reaction time to kinesthetic stimulus than all other groups, baseball players and non-athletes were not significantly different, and both were significantly slower than all other groups for the kinesthetic stimulus. To the visual stimulus, wrestlers and baseball players were significantly faster than all other groups but were not significantly different from each other. A moderate positive relationship existed between the two reaction time measures.

Yeo⁶ established relationship of reaction time, performance time and handball velocity to success in handball and reported that the player with the most ability in handball, demonstrate fast reaction time of the non dominant hand and fast performance of dominant hand. The conclusion was acted on the basis of data concerning 10 variables related to success in handball collected from 14 players who participated a round robin tournament.

Hammel and Stumper\textsuperscript{7} studied time in baseball batting reaction time for 25 physical majors were measured under two experimental conditions. It was found that the mean starting reaction time was approximately 21 seconds and the mean movement reaction time was .27 seconds. Some implication in batting under the game conditions were noted.

Phillip\textsuperscript{8} investigated 25 football athletes. Each subject performed 21 traits through run today light, seven trials at each age. C.R.T. and yds. Gained were subjected to correlation relationship between C.R.T. and football performance. Although the run-today light device was constructed to stimulate the football environment it appeared to relate the football performance utilised in this study.


Hill\textsuperscript{9} investigated the relationship of the reaction times and movement times of primary grade children to the variables of age, sex, motor ability and physical fitness. To achieve this purpose, the Iowa-Brace Test of Motor Ability, the Glover Physical Fitness Test, a reaction time test, and a movement time test were administered to one hundred thirty three male and one hundred twenty three female subjects five and eight years old.

Vellegra\textsuperscript{10} studied the net speed of arm movement made in response to sound of 45, 65 and 85 do. Loudness was measured by chronoscope. Reaction time was excluded. Thirty six college men were tested. In other experiment the force of successive contractions of the force arm muscles in response to serial auditors stimuli spaced five seconds apart was measured by a recording dynamometer. In both experiments


there was a balanced order of presenting the three stimulus intensities.

Slater\textsuperscript{11} measured reaction time to a visual stimulus and to an arm movement with the following purposes:

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

2. To compare reaction time measures for selected groups of varsity athletes, physical education majors, music majors and liberal arts majors.

Analysis of the data revealed that only a modest relationship existed between the two reaction time measures. Significant differences in reaction time were found among the several groups for both reaction time measures.

\textsuperscript{11} Hanmel, T. Slater, “Comparisons of Reaction Time Measures to a Visual Stimulus and Arm Movement” Research Quarterly 26:4 (December 1955) : 470.
Miller and Shay\textsuperscript{12} investigated the relationship of reaction time to the speed of a softball. They reported that the reaction time of the batter in softball is important because of short pitching distance and the speed of the pitcher. Nine pitchers were tested for speed and had an average velocity of 59.95 mph and a mean reaction time of .215 seconds was found for 258 students tested. With these averages, the ball would be 29.33 ft. from home plate before 116 of these subjects began their swing and in 41 cases the ball would be less than 20 ft. from the plate. Pitchers with greater velocity would decrease the success of the batter if the reaction time remains the same.

Keller\textsuperscript{13} measured the reaction time of 359 athletes and 274 non-athletes from two high schools and university. Whole body movement was made in response to light stimulation. Athletes responded faster than non-athletes. He reported that


\textsuperscript{13} Louis B. Keller, “The Relationship of Quickness of Body Movement to Success in Athletics,” \textit{Research Quarterly} 13 (May 1942) : 146.
baseball, basketball, football and track athletes comprising a group, showed significantly faster reaction time than the group including gymnastics, swimming and wrestling; but no significant difference was found between the sports within these groups.

Burley\(^{14}\) in his study of reaction time of physically trained men, selected 77 male subjects of State University of Iowa. Subjects were tested for simple and complex reaction time tests. It was concluded that all individuals reacted more slowly to complex stimuli than to simple stimulus. There existed a significant difference in speed and variability of reaction time among football linemen, football backs, high school letter winners and non letter winners.

Knapp\(^{15}\) investigated the reaction time of selected top class sportsmen and research students. Twenty top class players from different sports were selected and 20 research


students were taken as subjects for this study. The subject's reaction time was measured by his response to the cessation of a light stimulus. Analysis of data revealed that the reaction time of sportsmen were significantly shorter than those of the research students.

Johnson\textsuperscript{16} observed that reaction time decreases in more anxious subjects. Through out the developmental stage upto about 25 years of age reaction time decreases at first rapidly and then slowly following the same type of growth function.

Kacevich\textsuperscript{17} in order to determine the relationship between reaction time and general football playing ability and total reaction time and individual playing different positions of 82 varsity football players compared the RT as measured in laboratory with measured in field situation. Moment time was recorded electronically as the time between completion of RT necessary to run 10 yards. Total Reaction time was taken as

\textsuperscript{16} A.M. Johnson, "Influence of Incentive and Punishment upon Reaction Time" \textit{Archives Psychological} 62 (1922) : 570-575.

the sum of reaction time and movement time for trial. Statistically significant scores were calculated between total reaction time and team ranking and team reaction time and individuals playing different positions.

Sharma, Khan and Butchiramaiah\textsuperscript{18} compared the reaction time and concentration among recreational and competitive volleyball players. Competitive and recreational volleyball players (40 in each group) were tested for visual and auditory reaction time and ‘d’ test was used for measuring the concentration. They concluded:

1. The Competitive volleyball players respond more quickly to the visual and auditory stimuli when compared to the recreation volleyball players.

2. The competitive volleyball players have more concentration on the task requiring high attentivity.

3. The national level volleyball players are superior to the state level volleyball players in visual and auditory reaction time and concentration.

Bhanot and Sidhu\textsuperscript{19} studied the visual and auditory reaction time of the right hand and right foot of 59 subjects including Hockey players, volleyball players, Weight lifters and Gymnasts. The weight lifters were found significantly faster than hockey players, Volleyballers and Gymnasts for both visual and auditory reaction time of hand and foot. Hockey players were faster than Volleyballers and Gymnasts but the difference was significant only in auditory reaction time of hand and foot. Volleyballers were faster than Gymnasts but the difference is not significant. Visual and auditory reaction time of hand were faster than those of foot. Auditory reaction time of hand and foot was faster than the corresponding visual reaction time.

Sreejit\textsuperscript{20} studied the psychomotor performance variations among players of Basketball, Volleyball and Badminton. The subjects were tested on reaction time, speed of arm movement, multilimb coordination, arm-hand steadiness and finger dexterity. The significant differences in performance among the players of different sports on the selected psycho-motor variables were analysed by means of one way analysis of variance. He concluded that:

1. Basketball and volleyball players had a marked difference in their hand reaction times.

2. Basketball and Volleyball players exhibit differences in their speed of arm movement but to a lesser degree as compared to their hand reaction time.

3. Basketball, Volleyball and Badminton players did not exhibit any marked differences in their multilimb coordination, arm hand steadiness and finger dexterity.

\textsuperscript{20} K.P. Sreejit, “Selected Psychomotor Performance Variation Among Players of Different Sports” (Unpublished Master’s Thesis Jiwaji University, Gwalior, 1988).
According to Hull\textsuperscript{21} reaction time do differ from individual to individual and as also in the same individual it varies from day to day and even from event to event.

Devi\textsuperscript{22} made a study on 36 college level volleyball players to determine the relationship of depth perception, agility and speed of movement. Her findings reveal that depth perception, agility and speed of movement contribute to Volleyball playing ability. The significant correlation of agility and speed of movement may be expected in the game of Volleyball as it demands quick acceleration rate alongwith performing movement in any direction. The result showed a significant relationship with speed of movement and agility.

Herman\textsuperscript{23} studied male college baseball players (\(N=29\)) and were tested in group of five, stance sequence and presentation of a light stimulus varied for each battery. Five

swings were registered from each stance (closed, parallel and open) with reaction and movement times recorded. The various analysis yielded non-significant F's for reaction time and movement time across the three stances. Significant correlations were found between reaction time and movement time (88) in the closed stance, as well as reaction time and movement time in the different stances.

Sedgwick\textsuperscript{24} studied the relationship between resting, exercise and recovery heart rate following maximal heart rate and fitness criteria. Resting heart rate correlated significantly with the fitness criteria.

Bessemer\textsuperscript{25} through his study investigated the effect of different recovery methods on pulse rate following strenuous exercise. The subjects of the study were 12 members of the Illinois State University team. Harvard Step Test was given.


But no significant difference was observed between the three methods of recovery used.

Tuttle\textsuperscript{26} conducted a study for the standardization of exercise for the use in pulse ratio test. The subjects were 48 men of normal physical fitness. Tuttle reached the conclusion that the response of heart to exercise of graded intensity varies directly with the severity of exercise and this relationship was rectilinear.

Schwartz\textsuperscript{27} placed thirty male college subjects in two groups to discover if varying degrees of general muscular fatigue had any effect on depth perception. The experimental group pedaled a bicycle ergo meter under conditions of increasing work loads until a heart rate of 170 bpm was reached, or until unable to pedal was required. The depth perception scores and heart rate were recorded simultaneously at pre-selected times during the experimental period. All


subjects in the experimental groups were actively exercising during the time these data were collected. The data from the control group were collected following the same procedure except that they did not perform any physical work. ANOVA indicated no significant differences between the depth perception scores of the experimental and control groups; no significant changes occurred in depth perception scores during the experimental period, and no significant interaction affect. These findings were confirmed by the paired test that indicated no significant differences between initial and final depth perception scores of either group.

Landis and Hunt\textsuperscript{28} concluded that skin conductance was probably an indicator of change of direction of mental activity.