Chapter II

REVIEW OF RELATED LITERATURE

A serious and scholarly attempt has been made by the scholar to go through the related literature and a brief review of the studies related to the present problem has been described in this chapter.

Peterson¹ conducted a study to establish the prediction of basketball performance using psychomotor, cognitive, and anthropometric measures. Female members (N=43) of the top 4-teams in 1979 Missauri Small College Basketball tournament served as SS. The contributions of GPA, anaerobic leg power, 15 yard dash, 30 yard dash, total body RT, TRT, LT, and Wt. to basketball performance were determined. Basketball performance was determined by a specially designated formula by H.K. Kay Ht (r=.388) was the only Sig (P < .05) predictor. The 15 yard dash, total body RT, and power were next. The 'R' for the 4 top variables was .56 (P < .01).

Toner\(^2\) investigated the relationship of selected physical fitness and mood variables to success in female High School Basketball candidates. The study examined the relationship of physical fitness, skills, and mood variables success in female High School Basketball players being chosen to become varsity players. McNair's profile of mood states, Cooper's 12 minutes run test, AAHPER Jump and Reach test, AAHPER Shuttle run test, 30 yard dash, AAHPER under basket test, speed dribble test were administered to eighty one female High School Basketball candidates. Each of the three teams was treated on three separate occasions during the regular afternoon practice time for the teams. At the end of the testing and evaluation period, the few of coaches on the basis of their observations during drills and scrimmage competition independently related each candidate as either a successful or an unsuccessful performer. Discriminent analysis procedures supported the following hypothesis (a) The fitness factor, Skill testing and personal factors (known together as pre-season variables) were successful indicators of group

\(^2\)Mark Keven Toner, "The Relationship of Selected Physical Fitness, Skills and Mood Variables to Success in Female High School Basketball Candidates," Dissertation Abstracts International 42 (March 1982): 3909-A.
membership while the POMS variables were to a lesser extent (b) the battery of tests pre-season and POMS did correlate with coach's ratings.

Smith\(^3\) conducted a study of the effects of anxiety on shooting proficiency among college women basketball players. Members of the 1977-78 South Dakota State University Women's Basketball Team (N= 12) were measured on State Anxiety Inventory (SAI), Sport Competition Anxiety Test (SCAT), Pre-game HR, Game field Goal %, Game free throw %, Season field goal %, and Season free throw %. SS in group one consisted of players who attempted over 122 field goals during the season while group two attempted 95 field goals or less. Results of ANOVA indicated Sig (P < .05) difference between groups. On season field goal % and SAI subsequently data analysis throughout this study incorporated only the value from group 1. A Sig. r was found between scores on the SAI and SCAT. Sig. (P < .05) multiple regression equations to estimate field goal shooting proficiency from selected measures of anxiety produced multiple R's ranging from .47 to .66 and accounted far between 22 and 44% of the variance in

performance. A multiple regression equation for predicting free throw success was not sig. (P < .05).

Battles 4 studied the prediction Equation for Selection of Women Intercollegiate basketball team members. The purpose of this study was to develop a prediction equation for selection of women intercollegiate basketball team members. The subjects for this investigation were thirty three females who were participating in women's basketball of three colleges in Florida. Each subject completed a personal data form, the Athletic Motivational inventory (AMI), the known basketball test, sargent jump test, and field goal speed test. Selected anthropometric measurements were also obtained from each subject. Each head coach and each assistant were asked to rank each member of the team in order of how each contributed to team success. Three different team rankings were included in the statistical analysis. The rankings were head coach's rankings, the assistant coach's ranking and the average rankings of the head and assistant coaches. Significant correlations (.05 level) were found to exist

between the head coaches rankings and age and college basketball experience, and between the average of the head assistant coaches ranking and college basketball experience. Results of step-wise multiple regression indicated that players ranked high by head coaches tended to score high on a combination of physical and psychological variables. These variables included college basketball experience, height, vertical jump, mental toughness, and the AMI total score. Assistant coaches tended to select players with high scores on psychological variables which included interest, responsibility, mental toughness and aggression. The average ranking of the head coach and the assistants favoured players with college basketball experience responsibility, mental toughness, age and self confidence. Mental toughness was the only variable which consistently appeared regardless of the method of ranking.

Haehn\textsuperscript{5} conducted a study on knox basketball test as a predictive measure of overall basketball ability in female high school basketball players. The knox basketball four test items were administered to 198 girls from

9 MOSHSS during basketball try-outs and prior to any students being cut out from the team. The stepwise multiple regression procedure was used to analyse the predictive value of this test. The only test item that significantly predicted \( P < .05 \) the selection of players to the varsity and junior varsity teams was the dribble shoot test. The dribble shoot test also correlated significantly with the coaches rankings of junior varsity players and varsity players. The speed pass and the speed dribble significantly predicted the division between the junior varsity and varsity players. Although the comparisons were significant the skill tests accounted for only 11.1% to 28.3% of the total variation in the dependent variables.

Amusa\(^6\) conducted a study on the relationship between playing ability and selected measures. Forty six subjects were well conditioned soccer players with at least 2-years playing experience on the college level. They were tested for running speed, power, agility, max \( \text{VO}_2 \), strength, anaerobic capacity and flexibility. In addition, 11 anthropometric measurements consisting of skin folds and body

diameters were taken. Soccer playing ability served as the criterion and was measured by the ratings of 3 experienced soccer coaches based on selected soccer skills and strategies. Analysis of data was by zero order correlations and multiple 'R' analyses resulting in the following conclusions, age was the best single prediction of playing ability, weight, LBW and height were considered important factors in soccer performance, flexibility, agility, lactate concentration and leg power are not considered as valid indicators of playing ability.

Hammes\(^7\) found the relationship of bio-rhythm to selected aspects of basketball performance. In all 13 members were selected from 1976-77 UW-Eau Claire, Green Bay, and La Crosse Men's intercollegiate basketball teams who played in at least 21 games for a period of 20 min. or larger were evaluated on field goal %, free throw %, rebounds, assists, blocked shots, turn-overs and fouls. Complete bio-rhythm charts were computed for the season. A-3 way ANOVA revealed no significant difference between the player's game performance and his bio-rhythmic cycles.

Gardan predicted basketball playing ability of college women by selected tests. The purpose of this study was to determine the value of cardio-vascular capacity measure (Cooper's 12 Minutes Run), a leg power measure (Modified Sargent Jump-Reach) or upper body muscular strength and endurance (flexed arm hang), a percentage of body fat measure (Skinfold thickness), and measure of body height as predictors of basketball playing ability and to develop a statistical equation for predicting success in playing college basketball. The basketball playing ability or criterion measures were an ability Rating, a personality ability Rating, composite ability/personality Rating, the Null Comparative Rating Scale, and a ranking of the players by the coaches. The sample was twenty female basketball players from the 1976-77 University of Arkansas and North Eastern Oklahoma State University teams. Ten players from each school participated in the study.

The stepwise multiple regression programme was utilized to form prediction equations by the five tests.

or predictor variables being correlated with each of the five basketball playing ability measures. The prediction equation were selected using a criteria only those variables which had the lowest standard error of estimate and the greatest 'F' value. The equation produced a correlation coefficient of .786 and a standard error of estimate of + .392. The prediction equation from stepwise multiple Regression programme was basketball ability = 9.0532 + 1.36421 (12 Min. Run) - 0.11303 (Height).

From the results of this study the following conclusions were drawn: (i) The Cooper's 12 Minutes Run and height are the best measures for predicting basketball ability in this study, (ii) Measures of leg power and upper body strength and endurance are of the limited value when the 12 Minutes Run is used to predict basketball playing ability. (iii) Body Composition measures have some value in predicting basketball playing ability of college women.

Clarke\textsuperscript{9} developed a study of validation of a basketball potential skill test. The study was concerned

---

with the development of basketball potential skill test and the examination of its validity, reliability and objectivity.

A subjective analysis of the game and a review of pertinent literature resulted in the identification of three player success factor areas, anaerobic power, hand eye coordination, and agility, seven tests of these areas were administered during 1971-72 to forty four basketball oriented students who had divided themselves into sub-groups of twenty five candidates and nineteen non-candidates by individual decisions regarding inter-collegiate basketball candidacy. Biserial correlation was utilized to determine validity coefficient for each test with the most valid in each area comprising the final battery. Those retained were Jump and Reach (work) anaerobic power, 30 second under basket shot, hand eye coordination, four way Boomrang agility. Validity, objectivity and reliability were computed and they were .915, .994 and .896 respectively. A multiple regression equation was developed.

Dahl10 studied the relationship of jump shooting

ability in basketball to selected measurable traits. College basketball players (N=24) were tested on 11 independent variables and three criterion variables, accuracy from 10 ft., from 21 ft., and total accuracy. Wrist strength and flexibility correlated significantly with 10 ft. accuracy, wrist strength hand size, and hand reaction correlated significantly with 21 feet accuracy. Jump shooting ability from basket 10 to 21 ft. can be predicted from the developed regression equations.

Childness\textsuperscript{11} conducted a study on a factor and discriminant analysis to identify and determine the effectiveness of selected physical variables in predicting a successful basketball performer. The purpose of this study was to identify the components of high school basketball playing ability and to construct an evaluative tool for classifying high school basketball players into populations identified as successful and unsuccessful.

Twenty four test items were selected through a review of the related literature as valid measures of the components of high school basketball ability. The test

\textsuperscript{11} James Thomas Childness, "A Factor and Discriminant Analysis to Identify and Determine the Effectiveness of Selected Physical Variables in Predicting a Successful Basketball Performer," Dissertation Abstracts International 33 (November 1972): 2146-A.
items were administered to 106 high school basketball players and the resultant data were analyzed through the utilization of the principal axes method of factor analysis with various criterion for rotation. Seven factors were isolated and six factors were identified as agility, speed, relative muscular endurance, basketball speed manipulation, gross muscular strength, total body movement time and manual dexterity. One factor was unidentifiable in terms of common test items with high factor of loadings. The test batteries were constructed the first consisting of seven items loading highest on the isolated factors, the second was composed of ten test items. The first battery were utilized in a discriminant function analysis effectively classified the 106 subjects into two populations identified as successful and unsuccessful basketball players.

The results of this study indicated that the components of basketball ability could be isolated, measured and utilized to construct an evaluative tool for classifying players into two populations identified as successful and unsuccessful.
Ellenburg conducted a study to predict the value of selected physical variables in determining performance. The purpose of this study was to determine the value of a battery of ten skill tests and the personal factors of age, height and weight in predicting game performance of High School basketball players based on one season of play, to determine which of these tasks and personal factors are most useful to high school coaches and physical educators in predicting performance and to develop a method for predicting player performance in high school basketball competition.

The data was collected on 110 selected high school varsity basketball players in the 1969-70 basketball season. The performance data was collected by use of a performance rating chart designed by the writer. Means, standard deviations, product moment correlation coefficients and beta coefficients were computed from the data on the pre-season and performance variables. A correlation, multiple correlation and multiple regression equation was formulated. The study revealed the following: (i) The 30 seconds shooting test and vertical jump are the

---

most reliable predictors for the performance variables used in this study, (ii) Height, hand grip, vertical jump, wall volley and 30 seconds shooting test are the most important variables contributing to a players performance in this study. The five item test battery consisting of height, hand grip, vertical jump, wall volley and 30 second shooting test can be a practical and useful instrument in predicting some performance for high school basketball players.

Raymond\textsuperscript{13} investigated the characteristics of potential college basketball players. Basketball coaches from 4-classes of institutions were surveyed in an attempt to identify those characteristics coaches demanded most important in recruiting school athletes. The four classes of institutions were state colleges, and private colleges, state universities and private universities. Thirty six characteristics were analysed under five categories, attitude and personality, playing experience, physical qualities, mental ability, and financial need. Mean ratings were determined for each characteristic and each category.

No significant difference was found between the types of institutions and the qualities looked for in the recruiting practices.

Gallagher\(^{14}\) conducted a study of agility relationship to performance in Women's inter collegiate basketball. The hypotheses was that high positive relationships would exist between items of the test (Mc Canliff Agility Components Test) and performance were not supported. The lack of evidences to support the hypotheses was attributed to some unrespected peculiarities of the sample and several recommendations were made for continued investigation.

Holland\(^{15}\) predicted the selected variables in determining the agility to play basketball in Small High School. The measures included speed, agility, upper arm strength, power, ball handling ability, reaction time, shooting ability, passing ability, height, weight, age.


and previous experience. The criterion was the rating of the basketball playing ability of each squad member by his coach. The most important variables were experience, ball handling ability, passing ability, and shooting ability. The weighted index \( R = 76 \) was basketball ability score \( = (1.54) \) number of years experience \( + (1.23) \) score on speed dribble \( + (0.26) \) score on wall volley \( + (0.15) \) score on shooting test \( - 10.11 \).

Gilbert\(^{16}\) investigated a study of selected variables in predicting basketball players. It was demonstrated that a battery of 4 independent variables selected from a total of 10, best reflect composite basketball ability and performance at the college level. These 4-variables are ability criterion, arm strength, penny-cup test, and speed pass. However, since the derived multiple \( r \) of .95 was not reached. This limits the utilization of this battery as a predictive measure of basketball ability.

Phipps\(^{17}\) established a study of comparision of


selected factors predictive of volleyball playing ability. The purpose of this study was to compare selected general ability tests, specific skill tests and personality traits as predictors of volleyball performances in high school girls. It was a further purpose of this study to determine which of these variables had the highest relationship with overall performance. It was also the purpose of this study to determine which of these variables had the highest relationship with overall performance. It was also the purpose of this investigation to develop prediction equations from the three variables or combinations of the variables that framed worth while and to determine the validity of the selected equations.

Three general ability tests, three specific volleyball skill tests and a personality test were administered to 120 high school girls trying out for varsity teams in six schools. The coaches of each team assigned a subjective pre and post season score of each of their respective players. The post season score was used as a criterion measure. The data from three of the schools were used to develop prediction equations and data from the remaining schools were used to validate the equations. It was concluded that (i) there is a little relationship
between selected tests of general physical ability and volleyball performance. (ii) There is a substantial relationship between selected specific skill tests and volleyball performance. (iii) There is a little relationship between selected personality traits and volleyball performance. (iv) There is a substantial relationship between volleyball performance and the following combined models: Specific and general, specific and personality and specific, general and combined. (v) The specific test model is best predictor of volleyball performance. (vi) The best combined model for prediction is the general and specific. (vii) The specific test model and combinations of the general ability and personality with the specific are better predictors of volleyball performance than the coaches beginning of seasons judgement.

Chapman\textsuperscript{18} investigated the prediction of success in women's field Hockey. The purpose of this study was to determine what, if any predictive qualities could be identified in a group of skilled women field hockey players. The subjects were 106 players who participated in the

International Selection and Training Camps sponsored by the United States Field Hockey Association during summer, 1978. The specific areas of investigation were anxiety, visual perception, manual dexterity, ball control and dynamic balance. Five tests were selected to assess the prediction variables: (i) Sports Competition Anxiety Test (ii) Herkowitz's Moving Embedded Figures Test (iii) Minnesota Rate of Manipulation Test (iv) Chapmen ball Control Test and (v) Scatt Sideward Leap Test. The level of camp participation determined by player selection based on subjective evaluation of field hockey playing ability served as the criterion measure in the study. A multiple discriminant function analysis was computed to identify those variables which determined between the groups of selected camp participants. A one way analysis of variable was employed to assess the differences between groups of players according to their playing positions. The Shaffe Past Hockey Test was applied when a significant 'F' ratio indicated that differences existed. The Pearson's Correlation technique was utilized to determine the relationship between some selected predictor variables for the groups of selected women field hockey players. Visual perception and manual dexterity, as measured in this study did not
discriminate between successful and less successful field hockey players. Years of playing experience was not an important factor in group classification. Classification of subjects determined by the step-wise discriminant function analysis indicated that on the basis of the three discriminating variables correct, the group membership could be predicted 78.95 per cent of the time, provided the golies ball control skills were analyzed separately from those of the forwards and backs.

Walfe\textsuperscript{19} conducted a study on Anthropometrical, physiological and psychological measures to predict performance in cross country skiing. The purpose of this study was to determine if the selected variables of lean body weight, physical work capacity and sport competition anxiety test were related to the successful performance of cross-country skiers in competitive racing. Also to determine a single variable or combination of variables indicated statistically significant relationship with cross country skiing performance.

A total of seventy five volunteer subjects were

\textsuperscript{19}James Elmer Walfe, "Anthropometrical, Physiological and Psychological Measures to Predict Performance in Cross-country Skiing," Dissertation Abstracts International 40 (February 1980): 4478-A.
included who participated in ski-training camps and cross-country ski races sponsored by the Eastern Division of the United States Ski Association during the Winter of 1978-79. Pre-assessment tests to determine lean body weight, physical work capacity, and sport competition anxiety test results were administered to the subjects prior to the ski-training and ski-races. These variables were combined with the demographic variables of age, height and weight to form six dependent variables which were compared with the dependent variables of ski-race time and treated statistically using 't' tests, inter correlation and multiple regression analysis.

The following conclusions were made (i) No substantial significant correlations were found between the independent variables and ski-race time. (ii) Negative relationships were revealed between physical work capacity in ski-race time. (iii) No relationships were found between the sport competition anxiety test results and ski-race time. (iv) The relationships were found between combinations of two or more variables and ski-race time. (v) Significant relationships were found for regression equations that predict ski-race time in three of the group studied.
Marrow, Jackson, Hoster and Kachurik established the importance of strength, speed and body size for team success in women's Intercollegiate Volleyball. Various anthropometric, strength and speed variables were obtained on 180 Intercollegiate women volleyball players who participated in the regional round - robin tournament. The purpose of this study was to determine the factors underlying the motor performance of women and then determine if there was any relationship between the factors and team success. Factor analysis of the measured variables showed that the variables could be dimensioned as body size speed, fat, and strength. Multiple discriminant analysis showed that the teams were significantly different on the factors of strength and speed/fat. The two diimensioned discriminant space were plotted and the graphic representation showed that the stronger, faster and leaner teams were the most successful in tournament play. The results showed that the basic factors of speed/fat and strength were related to team success. Multiple discriminant analysis helped to identify the two most important individual

---

variables for team success. Upperbody strength and fat weight were identified as most important in differentiating between players of the most and least successful teams.

Voll predicted the basic modern dance skills through selected anthropometric and physical fitness measurements. The purpose of this study was to determine if ability in basic modern dance skills could be predicted by means of selected anthropometric and physical fitness measurements. Data for this study were collected on 24 female students participating in one of three non-eastern Pennsylvania Colleges. Measurements of height, weight, sitting vertex height, upper leg length, flexibility, abdominal strength, leg strength, cardio-vascular fitness and somototyping were taken. These measurements and six anthropometric ratios were statistically treated by BMD0ZR step wise regression programme developed by the health sciences computing facility, university of California at Los Angeles. A regression equation with a multiple 'R' of .8678 was presented by the author for the prediction of

the ability in basic modern dance skills and prediction tables for its computation were developed. The equation required the collection of 5 anthropometric measurements and two physical fitness tests on the basis of the findings of this study the author calculated that ability in modern dance skills can be predicted from selected anthropometric and physical fitness measurements.

Dehaies\textsuperscript{22} established a study on psychological variables to predict individual performance in Ice Hockey Players. One hundred and sixteen Quebee Jr. Major League hockey players were measured on 14 variables falling in the biological, psychological and specific motor skill categories. These variables were included in a step-wise regression analysis with Inc Hockey playing ability as the criterion variables. A prediction equation was obtained ($P < .05$) which included the following four variables: forward speed skating, motivation visual perceptual speed and anaerobic power. The multiple correlation coefficient obtained was 0.74. The 55% of variance in Ice hockey playing ability accounted for by the psychological

profile was larger than that observed individually for either the biological (17%) psychological (20%) or the specific skill profile (33%).

Breedlove predicted gymnastic performance based on personality traits and professed self concept was determined. Jackson's Personality Research Form and the TN Self Concept Scale were the ministered to 48 women collegiate gymnasts. Scores from those instruments were compared to performance in 4-individual gymnastic events (vault balance beam, uneven parallel bars, and floor exercise), and the all round event as determined by meet scores. Significant results were found between gymnastic ability and self concept measures of physical self, moral, ethical self, total variability, and column total variability. In the area of personality and frequency, additional statistical analysis using 'R' techniques were applied to determine if selected clusters of personality traits or self concept measures would be predictive of gymnastic performance. No significant factors were found.

Stranak\textsuperscript{24} developed a prediction equation for selecting college baseball players by way of multiple linear regression technique was the purpose of this study. Seventy one male volunteer college baseball players from three institutions of higher education in North Carolina were selected. The seven variables were the performance variables hitting, running, fielding and throwing plus behavioural characteristics associated with each and con- conitant variables including personality, baseball knowledge and fitness. Subjective rating of overall baseball ability was evaluated as served on the criterion measures. A personality profile was completed by each subject. Coach and a teacher made baseball knowledge examination was administered to the subjects, and fitness of the subjects was evaluated. The performance variables were measured during an actual game situation involving the varsity baseball teams. The total period of collecting the data was ten weeks.

Analysis of co-variance was used, there was found to be regression in the sample of subjects and by multiple step-wise linear regression a prediction equation for

over all baseball ability was developed. The equation was overall baseball ability = .015 (personality) + .009 (baseball knowledge) + .120 (hitting) + .403 (fielding) - .982, thus revealing significant partial regression coefficient.

David and Robert²⁵ conducted a study on predicting potential in football players. In the first part of this study, the football potential of 67 football players was predicted from their scores on a football potential test. The test battery consisted of motor ability items as well as football skill items (McCay's Classification Index, Strength, Power, time to hit, Audio-visual agility speed, work out put). Substantial correlations were obtained between most test items and the test criterion, the sum of 'T' scores, size as depicted by McCay's classification Index (CI) had a negative non-significant correlation with the criterion. The discriminative power of the battery was evidenced by the highly significant correlation between the test criterion and the coaching staff's ranking of individual players (rho= .840). It was concluded that athletic potential in football can be predicted by

testing.

In the second of this study, football teams from three different starta of competition were evaluated on the basis of the same test battery. The battery substantiated a step-wise progression between being noted. The test showed validity in that the criterion (the sum of 'T' scores) was significantly different between the teams.

Greenockle\(^{26}\) developed a test battery for women's gymnastics. Twenty two subjects were enrolled in a physical education professional's gymnastics course at LU, participated in supplying the data for the study. The test battery of 17 physical fitness tests was administered to all subjects at the beginning of the semester. After 8 weeks of instruction, subjects were rated on 10 different skill combinations and the Wherry-Doolittle Test Selection Method was applied to develop the test battery provided a multiple co-relation of \(r=.79\) with the ratings. The weighted battery scores were then converted to equivalent rankings and recommendations for screening were evolved.

---

Atkinson conducted a study on prediction of performance in tennis, handball and badminton from certain physical traits. Regression equations using physical traits and class commitment as predictors were developed for determining potential skill in beginning tennis, badminton and handball for college men. The physical traits used were: agility, power, hand eye coordination and visual ability. Skill level was determined by a round robin tournament in each sport. Subjects were 140 college men enrolled in beginning classes for each sport and taught by the whole-past method. The controlled subjects included 138 subjects enrolled in at the beginning classes and taught by past method. Another purpose of the study was to determine if practice in the sport would significantly improve scores in the physical traits. A paired t was used to compare experimental and control groups. Conclusions were class commitment is probably an integral part of skill attainment in the sports studied, students taught tennis and badminton by the whole past method experience greater gain in agility and hand eye co-ordination, students taught tennis by the past-method

experience greater gains in shoulder girdle power.

Crites studied the relationship of swimming performance to selected physiological and psychological factors. The purpose of this study was to determine the relationship of selected physiological and psychological factors as they related to the beginning swimmers' ability to perform the crawl stroke and contribute to the teachers understanding and instructional approach toward a beginning swimmer.

Forty subjects who were members of two beginning swimming classes were used for this study. The beginning swimming classes met for forty minutes twice a week. Prior to any swimming instruction, measurements were collected on shoulder rotation, shoulder extension strength, hip extension strength, body composition, swimming anxiety and swimming ability as measured by the power test (revised). After five weeks of Crawl stroke instruction, measurements were again taken on swimming anxiety and swimming ability. The data were then analysed by using the Pearson Product Moment correlation to identify significant relationships.

Crites, Jerry Keith, "A Study of Selected Physiological and Psychological Factors to Determine their Relationship to the Performance of the Crawl Stroke by Beginning Swimmers," Dissertation Abstracts International 36 (October 1975): 2084-A.
It was found that (i) shoulder rotation, shoulder extension strength, hip extension strength and body composition were not significant factors in the performance of Crawl Stroke and (ii) a significant relationship was indicated between swimming anxiety and the ability to perform the Crawl Stroke.

Jones conducted a study on effect of anxiety and need for achievement on the performance of high school wrestlers. Data were obtained by the Thematic Appreciation Test. The test Anxiety Questionnaire, expectancy ratings by the individuals and by their coaches. Performance data were obtained from match score boards and observation. It was concluded that the personality traits of anxiety and need for achievement had a tendency to influence both the expectancy and the actual performances of these high school wrestlers. Subjects who measured low in anxiety level performed better than those high in anxiety. The group scoring highest in performance was that of low anxiety and high need for achievement. The lowest level of performance was demonstrated by the group high in anxiety and low in need for achievement.

---

Talton investigated physical and psychological predictors of successful high school football performers. The purpose of the study was to determine if successful inter-scholastic football players could be predicted using selected physical and psychological assessments. Coaches classified the subjects into successful and unsuccessful player category based on performance in the 1971 football season. Subjects were 156 football players from the eleventh and twelfth grades in IAAAA public high schools. The ages of the athletes ranged between 16 and 19 years.

The 34 structural, strength, motor and psychological assessments in this investigation were statistically evaluated to select a variable on combination of variables having a high predictive power in discriminating successful from unsuccessful football athletes. The scores of the 101 successful athletes and the scores of the 55 unsuccessful athletes were examined by the following methods: (i) factor analysis, (ii) correlation, and (iii) Percent of mean differences.

---

A single predictive variable was not identified, however, two combinations of variables were selected. One the short test battery was composed of the following variables (i) age (ii) right grip strength (iii) Roger's arm strength score (iv) elbow flexion strength, (v) trunk extension strength (vi) 10 yard dash, (vii) 60 yard agility run (viii) emotional stability, and (ix) sociability. The second combination, the long test battery was composed of 18 variables, (i) age, (ii) right grip strength, (iii) back lift (iv) leg lift, (v) bar dips, (vi) Roger's arm strength, (vii) Roger's strength Index, (viii) Roger's Physical Fitness Index, (ix) Shoulder flexion, (x) elbow flexion strength, (xi) trunk flexion, (xii) trunk extension strength, (xiii) 10 yard dash, (xiv) 60 yard agility run, (xv) ascendancy, (xvi) responsibility, (xvii) emotional stability, and (xviii) sociability.

Bowman identified Biographical, physiological and psychological factors for wrestling success in High School. The study investigated the relationship between twenty nine biographical, physiological and psychological

---

factors and success in wrestling. The purposes of this study were to identify independent variables that were significantly related to wrestling success and to formulate a regression equation to predict wrestling success. One hundred thirty six Idaho high school wrestlers were tested during the year 1969-70 wrestling season. The data from the factor tests and the seasons won-loss records were analyzed by multiple correlation and regression analysis of Brigham Young University in Provo, Utah. The findings of this study were (i) All twenty nine independent variables that biographical variables and the physiological variables were significantly related to wrestling success at the .05 level (ii) Seven factors - age, years of wrestling experience, hand grip strength, upper body strength, cardio-vascular endurance, desire to achieve and desire to experiment were significantly related to wrestling success at the .05 level.

Raevas\(^{32}\) conducted a study to determine the ability to predict performance of a motor task when there were no past experiences perceived which could give clues

upon which to base expectancy. The major concerns explored relative to the untried tasks were, expectancy reports, performance, anxiety levels in predicting untried task performance, attitudes toward physical education, social status and ego strength. It was found that an individual can predict on untried performance, and that some subjects predict with much greater proficiency than others. Data gathered from the supplementary tasks indicated social status and anxiety to be major concerns associated with level of expectancy, but not with the proficiency with which subjects predicted.

Smith$^{33}$ derived the relationship of volleyball playing ability to scores achieved in the sargent jump. The .68 beginning players group was formed. 11 varsity players and 3 highly skilled and experienced players were selected. Vertical jump co-rrelated .35 with the Brady test, .55 with the judges evaluation, and .50 with a combination of Brady test and judges evaluation for the beginning players. The 'r' between the vertical jumping ability of the varsity players and potential playing ability ranking by their coach was .36. It was concluded

that the vertical jump is not an accurate predictor of volleyball playing ability.

Bakker\(^{34}\) studied the factors associated with success in volleyball. Subjects were 28 members of women's extramural volleyball teams at Illinois State University. Two experienced Volleyball coaches established the criterion by rating each player or her playing. The following variables were measured: height, weight, leg extensor strength using the multiple angle testing unit, grip strength using a adjustable dynamometer, skinfolds using the Lange Caliper, jumping ability by using jump and reach test, and an apparatus constructed by the investigator to measure reaction and movement times. Through 't' test and co-rerelations it was found that jumping ability and reaction time were significantly related to success in volleyball. A multiple co-relation (R) of .718 was obtained between the 9 variables and the criterion. And 'R' of .53 was obtained between the criterion and reaction time plus jumping ability, and one of .52 between the criterion and jumping ability plus weight. The regression equation computed in this study

could be used to predict success in volleyball playing.

Lampman\textsuperscript{35} conducted a study on Anxiety and its effect on the performance of competitive swimmers. The purpose of this study was to investigate the relationship of the psychological variable anxiety on the performance of competitive swimmers and to determine what differences, if any, could be found between swimmers of champion and non-champion caliber. Fifteen members of the university of Florida swimming team served as subjects. An anxiety test was given to the swimmers before the season and approximately one hour before the competition. The general conclusions drawn were an upward fluctuation in anxiety one hour before competition facilitates in anxiety patterns between the two experienced groups, swimmers performed better if their pre-meet anxiety level was relatively equal to or slightly above their pre-season anxiety level.

Tharke\textsuperscript{36} investigated the relation of intelligence and skill with success in singles competition in

\begin{flushright}
\end{flushright}

\begin{flushright}
\textsuperscript{36}Jo Anne Tharke, "Intelligence and Skill in Relation to Success in Single Competition in Badminton and Tennis," Research Quarterly 38 (March 1967): 119.
\end{flushright}
badminton and tennis. The purpose of this study was to find out the relation of intelligence and skill to their success in round-robin singles competition in badminton and tennis. Intelligence was measured by the Otis Quick scoring mental ability test, skill was determined by the subjects combined T-score on two standardized tests of badminton and tennis skill, and success in tournament play was expressed by the percentage of points won out of the number possible during tournament play. Prior to the competition, subjects were classified on the basis of skill by means of a skill test and placed into leagues between eight and eleven players each. Tests of equivalence were applied to determine the equality of league with respect to skill and intelligence. An analysis of variance employing success as the dependent variable and involving two levels of skill and intelligence (high and low) and two levels of sport (badminton and tennis) resulted in a highly significant 'F' ratio for the skill variable and non significant 'F' ratios for intelligence and sports. Interaction factors were generally non-significant co-relation co-efficients between skill and success in badminton and tennis were .65 and .60 respectively, and co-efficients between intelligence and success were essentially zero.
Schwarzkopt predicted gymnastic ability by using IOWA-Brace Test as a measuring instrument. This test was administered for 33 students in a gymnastics skills class prior to a quarter of instruction. The Minnesota Gymnastic Skills test and Gymnastic class final performance test were given following instruction. The correlations between the IOWA-Brace Test and the gymnastics skills tests were .529 and .646.

Hooks analysed baseball ability through an analysis of measures of strength and structure. The purpose of this study was to determine the relation of 19 selected structural and strength measures to success in baseball skills of hitting, running, throwing and fielding plus overall baseball ability. The structural measures tested have consistently low correlations with the criteria. The measures of strength tested have consistently high correlations with the criteria, .79 left shoulder flexion with hitting; .72, right shoulder flexion


with throwing; .67, left shoulder flexion with total ability. Left shoulder flexion is the best single measures found to predict baseball ability. Right shoulder flexion ranks second.

Everett\textsuperscript{39} conducted a study on baseball playing ability prediction. Thirty university of IOWA varsity baseball players were tested by the author on ability to throw for distance, running speed and agility (shuttle run), ability to visualize spatial relationships, ability to make decisions quickly and motor capacity. These subjects were rated according to playing ability by the coach.

Product moment co-relation, partial co-relation and multiple co-relation were computed and the following conclusions were made: (i) from the results obtained, the sargent jump in the best single measure for selecting baseball talent, (ii) that the best economical combination found in this study to predict baseball ability is the sargent jump 'S' test, and the blocks test.

\[ T\text{-score} = 0.92 \text{ Sargent Jump (cms)} - 0.08 \text{ 'S' test (score)} - 0.23 \text{ Blocks test (sec.)} + 16.19. \]

Keller\textsuperscript{40} found the relationship of quickness of bodily movement to success in athletics. The Investigation was carried out to determine the nature of the relationship between "quickness of bodily movement" and success in athletics. Measurements were taken of 755 men and boys in the university of Minnesota, Columbia Heights, Minnesota High School, and the university of Minnesota High School. All subjects were placed under two categories namely athletes and non athletes. "Total body movement" was measured by a test consisting of a quick action of one arm, one foot, and the trunk combined into one movement, either to the left, to the right or forward. A test was devised to measure "total body quickness" because none of the existing tests and techniques was found to be adequate for measuring it.

A 't' test and chi\textsuperscript{6} square was used to statistically analyze the data and the following conclusions were drawn (i) There is a positive relationship between the ability to move the body quickly and success in athletics. (ii) The requirement in quickness of bodily

\textsuperscript{40} Louis F. Keller, "The Relation of Quickness of Bodily Movement to Success in Athletics," Research Quarterly 13 (May 1942): 146.
movements are not the same for all sports. A person with relatively slow total body reaction time has a better chance to obtaining success in the more individual activities such as gymnastics, swimming and wrestling than in baseball, basketball, football and the like.