PARTICIPATION IN ATHLETICS AND ITS EFFECT ON ACADEMIC SUCCESS AT CENTRAL MICHIGAN UNIVERSITY

Thesis for the Degree of Ed. D.

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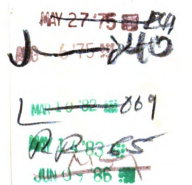

PARTICIPATION IN ATHLETICS AND ITS EFFECT ON ACADEMIC SUCCESS AT CENTRAL MICHIGAN UNIVERSITY

By

Richard Jay Kirchner

AN ABSTRACT OF A THESIS

Submitted to
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ABSTRACT

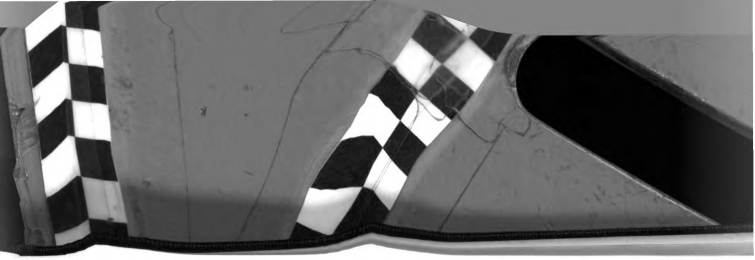
PARTICIPATION IN ATHLETICS AND ITS EFFECT ON ACADEMIC SUCCESS AT CENTRAL MICHIGAN UNIVERSITY

by Richard Jay Kirchner

The purpose of this investigation was to determine whether or not participation in athletics at Central Michigan University had any desirable or undesirable effect on the academic success of the participants.

The study was conducted over a five year period from the academic year 1955-56 to the academic year 1959-60. All of the individuals who were on varsity teams, were not transfer students, and for whom college aptitude scores were available, were matched with non-athletes. The non-athletes and athletes were matched on the basis of the year they began college, their major and their minors. By an analysis of covariance, the effect of the college aptitude was held constant and the analysis for difference in mean honor point average was made.

Various sub-groups were analyzed including each of the individual sports in which competition is sponsored at Central Michigan University.



Richard Jay Kirchner

High levels of significant difference in mean academic achievement (.001 level of confidence) were found for the following sub-groups: (1) Non-pressure sports (F-ratio of 12.600), (2) Minor sports (F-ratio of 16.870), (3) Wrestling (F-ratio of 15.540) and (4) Participants in two or more sports (F-ratio of 15.810).

Other significant sub-groups included: (1) Major sports (F-ratio of 5.564), (2) Tennis (F-ratio of 8.320), (3) Cross-country (F-ratio of 4.730) and (4) Freshmen on varsity teams (F-ratio of 5.080).

The following general conclusions applicable only to Central Michigan University were drawn:

1. Athletic participation did not have a detrimental effect on scholarship of athletes at Central Michigan University.

2. Individual sports showing the greatest academic success were track, wrestling and cross-country.

3. The non-pressure and minor sports showed the highest level of academic success.

4. Freshmen participating on varsity teams showed superior scholastic achievement when compared with their non-athlete controls.

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The investigator would like to acknowledge the very great cooperation given him by the administration of Central Michigan University in making available all of the necessary data. Special mention should be made of Dr. Donald Kilbourn, Dr. King McCristal and Dr. Randolph Webster who assisted with the early planning, making many constructive suggestions; Mr. George Lauer, registrar and person directly responsible for making records available to the investigator; Dr. Wilbur Waggoner for his guidance in the statistical analysis and interpretation of the data; and Mr. Douglas Wooley for his assistance in wiring and programming the I. B. M. equipment. The guidance and cooperation of my committee (Dr. Wayne Van Huss, chairman; Dr. G. Mikles; Dr. Walter Johnson and Dr. J. Dzenowagis) was most valuable throughout the program.

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CHAPTER 1

INTRODUCTION TO THE PROBLEM

During a period of time when the academicians in American education circles and in popular writings are attacking the "frills" of education, it becomes increasingly important that all areas of school activity be soundly grounded. Participation in athletics, as well as participation in debate, band and many other activities commonly found on the college campus, can be defended on their own merit. However, it is not the purpose of this paper to attempt to defend or attack athletic participation. Instead, this study will take the basic premise that academic success is the sole objective of college life (a premise that may well be debated) and attempt to determine if participation in another educational activity, varsity athletics, is detrimental to scholastic achievement.

1. THE PROBLEM

Importance of the Study

For the past five years the Interstate Intercollegiate Athletic Conference, of which Central Michigan University is a member, has been contemplating a "freshman rule" that would in effect bring the conference's

athletic policies more in line with the National Collegiate Athletic Association and be a departure from the general policies of the national Association of Intercollegiate Athletics. One of the many arguments that has been used by the academic members of the various institution's faculty boards of control is the harm that is being done the academic achievement of freshmen due to their participation in athletics. In addition, it has often been claimed that the student, regardless of college class, suffers academically from participation in the varsity athletic program.

In a smaller voice, the opponents of this point of view have claimed that participation in athletics actually helps men to attain better scholarship. They have said that the athlete has superior success academically due to the closer counseling he received and the added stimulation from eligibility requirements.

Statement of the Problem

Since this question had been answered largely on personal opinions and prejudices, the purpose of this study was: (1) to determine what effect, if any, athletic participation had on academic success in college, (2) if athletic participation had an effect on academic success, did it have a greater or lesser effect on freshmen competing on varsity teams? (3) assuming

that athletic participation had an effect on the academic success of freshmen competing on varsity teams, is this a greater effect than on freshmen competing on recognized freshmen teams? and (4) is there any difference between the effects of participation in major or pressure sports and minor sports?

The problem that the investigator wished to pursue was whether or not participation in athletics affected scholastic success as measured by honor point ratio. In the past, many authors have compared academic performance of athletes and non-athletes. Whether or not a man participated in athletics seemed to have little effect on the quality of his scholastic work. However, these have been simple status studies and generally no attempt has been made to analyze the data.

One of the most frequent complaints concerning this type of study is that the two groups did not have comparable courses of study with the inference that the athletes were taking easier courses. Although this had been contra-indicated by Davis and Pobanz,[1] and their conclusion was later substantiated by Snedden,[2] the investigator decided

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[1]C. O. Davis and J. F. Pobanz, "Subjects Pursued by Winners of the 'M' at the University of Michigan," Education Administration and Supervision, 4 (April, 1918), 222.

[2]D. Snedden, "Athletes and Scholarship," Harvard Alumni Bulletin, 31 (December 20, 1928), 362.

to match the athletes and non-athletes on the basis of their major and minor fields of study as declared by the individuals in their personal record file. In addition, since it is of interest to determine the effect of participation, the factor of college aptitude, as measured by the total score (T-score)[3] of the ACE college aptitude test, was held constant by the analysis of covariance statistical technique. In this way, the sample consisted of two stratified random samples (one athlete and the other non-athlete) with similar courses of study and with the effect of their college aptitude removed.

Scope of the Study

This study involved athletes and non-athletes at Central Michigan University who had ACE-T scores available and had not transferred from another university, college or junior college. The population was selected from the athletes attending Central Michigan University between the academic years 1955-56 and 1959-60 inclusive. The non-athlete sample was drawn from the student body attending Central Michigan during comparable dates. Central Michigan is a university located in Mt. Pleasant, Michigan. Its 1959-60 resident enrollment was about 4,950.

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[3]The T-score of the ACE is a total of the verbal and nonverbal components of the ACE examination and is not to be confused with the standard score referred to as a T-score.

Limitations of the Study

The following limitations pertaining to this study have been recognized and, where possible, attempts have been made to negate them:

1. Accurate records might not have been readily available on all experimental and control subjects.

2. The claim had been made by some of the Interstate Intercollegiate Athletic Conference coaches that because of the small amount of financial aid given in this conference, many of the athletes recruited were not of as high potential scholastic ability as the rest of the student body.

3. Certain individuals may have helped the athlete remain eligible by giving athletes breaks in the grading system.

4. The school may have had anti-athlete instructors who intentionally made the course requirements difficult for athletes to meet.

5. An athlete may have lettered in more than one sport. In this event, he was recorded once in overall calculations but in individual sport breakdowns, he may have appeared on two or more athletic teams.

6. In spite of comparable fields of study, the experimental and control groups may not have had comparable courses.

7. Many factors that affected scholastic success may not have been accounted for. It is believed that by having used the total population of athletes and having randomly selected the control group, the influence of these factors was held to a minimum.

8. Since this study was a semester by semester comparison rather than a person by person comparison, one person may have exerted considerable influence on the results while others exerted comparatively little. In groups where the number of cases was large this was of little importance but in the smaller sub-groups it became a major factor.

11. DEFINITIONS OF TERMS

The following terms were defined because of their many connotations at various institutions and because of their unique use in certain instances at Central Michigan University.

Academic Success. Measured by the honor point ratio.

Athlete. Any boy who received a varsity award at Central Michigan University in any given year of the study, or any boy who remained with a varsity team for a full season of competition, or any boy who would have received a letter as a result of his participation had he remained

academically eligible for a full school year.

College Aptitude. The score achieved on the ACE-T college aptitude examination.

Eligible Athlete. Any athlete who met the eligibility requirements of Central Michigan University. He must have been taking at least twelve semester hour credits at the time of competition and, with the exception of first semester freshmen, must have passed at least eleven semester hour credits the semester prior to competition. In addition, he must have had a cumulative honor point ratio of: (1) first semester freshman -- no requirement, (2) second semester freshman -- 0.7 honor points per credit, (3) first semester sophomore -- 0.8 honor points per credit, (4) second semester sophomore -- 0.9 honor points per credit, and (5) junior and above -- 1.0 honor points per credit. The maximum possible number of honor points per credit was three for eligibility purposes.

Freshman. Any student who had not had a previous year of competition at the college level and had earned less than thirty credits. In the event that such a student would have two classifications, the one based on credits prevailed providing it did not classify a student as a freshman who had prior college competition.

Freshman Rule. A rule proposed by certain members of the Interstate Intercollegiate Athletic Conference

faculty boards of control that would have prohibited freshmen from participating on varsity teams. At the time of the study, freshmen were eligible for competition on varsity teams in the Interstate Intercollegiate Athletic Conference.

Honor Points. Points awarded for scholastic attainment in college course work. An "A" is worth four honor points per credit; "B", three honor points per credit; "C", two honor points per credit; "D", one honor point per credit and "E", zero honor points per credit. For eligibility, deduct one honor point from the honor point ratio (the total honor points divided by the total credits carried or earned) to place the student on the three-point system used by the Interstate Intercollegiate Athletic Conference.

Honor Point Ratio. The total honor points acquired divided by the total number of credits earned plus failures.

Junior. Any student who had earned over fifty-nine credits and less than ninety credits or had just two prior seasons of competition. In the event that such a student had two classifications, the one based on credits prevailed providing it did not classify a student as a junior who had three or more years of prior college competition.

Major Sport. Any sport that received major point totals in the Interstate Intercollegiate Athletic Conference all-sports trophy competition. These sports were football,

basketball, baseball and track.

Minor Sport. Any sport that received minor sport point totals in the Interstate Intercollegiate Athletic Conference all-sports trophy competition. The sports that received minor point totals were cross-country, gymnastics, swimming, golf, tennis and wrestling.

Passing Grade. D or above.

Pressure Sport. Football and basketball.

Sophomore. Any student who had earned over twenty-nine credits and less than fifty-nine credits or had just one prior season of competition. In the event that such a student had two classifications, the one based on credits prevailed providing it did not classify a student as a sophomore who had two or more years of previous competition.

Senior. Any student who had earned over eighty-nine credits but less than sufficient credits to graduate or had three prior seasons of competition. In the event that such a student had two classifications, the one based on credits prevailed providing it did not classify a student as a senior who had four prior years of competition.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to determine whether or not participation in athletics had any effect on scholastic success at Central Michigan University. To determine the effect of participation, athletes and non-athletes were matched according to year they began college, majors and minors. By an analysis of co-variance, the effect of college aptitude was held constant and the difference in mean honor point average was analyzed for significance.

GENERAL WEAKNESSES OF PAST LITERATURE

As early as 1921, Jacobsen noted that most past studies of the effect of athletic participation on scholarship were weak because the results had not been subjected to statistical analyses.[1] Very few studies reviewed involved college athletes and even the more recent ones had a tendency to avoid any statistical treatment or serious effort at controlling the samples.

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[1]John M. Jacobsen, "Athletics and Scholarship in the High School," School Review, 39:280.

EFFECT OF INTRAMURAL PARTICIPATION

Three studies have been completed that compared the academic achievements of participants and non-participants in intramural activities. Somers concluded that "participation in class team competition does not appreciably affect either adversely or favorably, the academic grades of student participants."[2] This study supported two prior studies involving intramural participation. Waskes found that there was a higher scholastic attainment by those who had participated in the intramural program and in a final summation stated that "..... at least (intramural participation) has no deleterious effect on the participant's scholastic attainment."[3] Hackensmith and Miller worked only with team sports in the college intramural program and concluded that the one hundred and sixty one participants had a higher median scholastic ranking than the one hundred and sixty one non-participants.[4] The average

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[2]M. R. Somers, "Comparative Study of Participation in Extracurricular Sports and Academic Grades," Research Quarterly, 22 (March, 1951), 89.

[3]Paul R. Waskes, "A Study of Intramural Sports Participation and Scholastic Attainment at the University of Oregon," Research Quarterly, 11 (May, 1940), 27.

[4]C. W. Hackensmith and L. Miller, "Comparison of the Academic Grades and Intelligence Scores of Participants and Non-participants in Intramural Athletics at the University of Kentucky," Research Quarterly, 9 (March, 1938), 94.

number of activities by each participant was six. Further, they concluded that freshman participation did not have a marked effect upon the students academic grades and sophomore participants showed a slightly higher mean academic average. Junior and senior intramural participants demonstrated a definitely higher mean academic achievement than did the non-participants of the same class.

Sperling included three groups in his investigation at the City College of New York in studying personality differences between varsity athletes, intramural athletes and non-athletes.[5] He concluded, "A more socially desirable degree of personality development accompanies a greater degree of experience in physical education activities."[6] Beck, on the other hand, while not disagreeing with this point, makes a strong plea that perhaps we are expecting too much from our athletes when we require them to work as well as practice and study while taking a full academic load.[7]

The majority of the studies reviewed seemed to

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[5]Abraham P. Sperling, "The Relationship Between Personality Adjustment and Achievement in Physical Education Activities," Research Quarterly, 13 (October, 1942), 351.

[6]Ibid., pp 363.

[7]R. L. Beck, "Athletitis or the Academic Background of the Athlete," School and Society, 55 (February, 1942, 215.

indicate that athletics contributed to, or at least did not detract from, academic success. Many different criteria were used to determine academic success but the most popular was the honor point ratio.

LITERATURE AGAINST INTERCOLLEGIATE COMPETITION

Marco was one of the dissenters.[8] Using the per cent of students graduating from William and Mary College, he determined that only 32.2 per cent of the football players graduated while 55.9 per cent of the general student body graduated. This was in spite of the fact that the athletes selected the less demanding curricula. Maney, using the academic averages of football players over a ten year period concluded that there was an "unmistakeable evidence of overemphasis on college football."[9] He concluded this because the grades of football players were lower than the grades of other men during the ten years studied. In addition, spring semester grades for both groups were higher which he also attributed to the overemphasis on football.

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[8]S. M. Marco, "Place of Intercollegiate Athletics in Higher Education," Journal of Higher Education, 31 (November, 1960), 422.

[9]C. A. Maney, "The Grades of College Football Students," School and Society, 38 (1933), 307.

Champlin made the point that most criticism of athletics is justified only when a small minority of the athletes is being considered.[10]

LITERATURE SUPPORTING INTERCOLLEGIATE COMPETITION

A number of uncontrolled or poorly controlled studies arrive at somewhat different conclusions when working with high school boys. Reals and Reess concluded that although intelligence quotient scores were slightly in favor of non-athletes, teachers' marks favor athletes.[11] This conclusion was substantiated by the work of Ray[12] and Pangle.[13]

Connor concluded that there is no significant difference between the scholastic attainment of athletes and non-athletes and therefore, participation in athletic

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[10]C. D. Champlin, "Diagnosing Athletitis," School and Society, 55 (May 23, 1942), 587.

[11]W. H. Reals and R. G. Reess, "High School Lettermen - Their Intelligence and Scholarship," School Review, 47 (September, 1939), 534.

[12]Howard C. Ray, "Inter-relationships of Physical and Mental Abilities and Achievement of High School Boys," Research Quarterly, 11 (March, 1940), 129.

[13]R. Pangle, "Scholastic Attainment and the High School Athlete," Peabody Journal of Education, 33 (May, 1956), 360.

activity did not have an adverse effect on scholastic success.[14] Jones[15] and Olson[16] disagreed that athletes scored below normal on intelligence tests. They found that athletes were more intelligent than non-athletes. In addition, Jones found that a smaller percentage of athletes than non-athletes were in the lower intelligence levels. Keating compared the season of participation with the season of non-participation in varsity high school athletics.[17] He found that 51.7 per cent of the participants had higher grades in season; 26.8 per cent had lower grades in season and 21.5 per cent had grades equal during participation and non-participation semesters. Jacobsen was a little more cautious but he also concluded that the scholarship of athletes did not seem to suffer appreciably during

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[14]Thomas Connor, "Varsity Athletes Make Superior Scholars," Scholastic Coach, 24 (November, 1954), 56.

[15]R. H. Jones, "Comparison of the Intelligence of High School Athletes with Non-Athletes," School and Society, 42 (September, 1935), 415.

[16]Arne L. Olson, "Characteristics of Fifteen Year Old Boys Classified as Outstanding Athletes, Scientists, Fine Artists, Leaders, Scholars, or as Poor Students or Delinquents" (paper read at the American Association of Health, Physical Education and Recreation convention, Cincinnati, Ohio, April 10, 1962).

[17]Waldo T. Keating, "Scholarship of Participants in Football," Athletic Journal, 41 (February, 1961), 11.

the period of participation.[18] He concluded that athletes were generally of average mental ability and tended to stand as high as, if not slightly higher than, non-athletes in academic achievement as measured by school marks.

Most of the studies already summarized have some weaknesses from the research point of view but can be accepted as being honest efforts to acquire some indication as to the academic ability of athletes. In a few, the bias of the author seemed apparent. In many, the lack of adequate controls and sampling procedures must be taken into consideration when reading them. However, the preponderance of evidence began to take form.

LITERATURE INVOLVING MATCHING

In some studies, attempts have been made to match athletes and non-athletes on various criteria. Often these criteria are vague or extremely generalized but the investigator believes that any honest attempt to eliminate possible bias from the study by matching procedures is worthwhile of note. In one of the earliest studies, Cook and Thompson matched athletes on the basis of the year the athletes started school and the number of semesters that the

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[18]John M. Jacobsen, "Athletics and Scholarship in the High School," School Review, 39:280.

athlete remained in high school.[19] They concluded that "athletes are more likely to graduate than non-athletes", and that "athletic interest causes a pupil to be less willing to miss school because of the necessity of regular practice."[20] They also pointed out that athletes did just a trifle poorer scholastically. Eaton and Shannon compared high school lettermen and non-lettermen with respect to intelligence percentiles.[21] They found that high school athletes were lower in intelligence and achievement but that achievement related to intelligence was higher.

It may reasonably be assumed that athletes have greater physical fitness than non-athletes. Therefore, it is interesting to look at the relationship between scholarship and physical fitness. Giauque found that there was "no reasonable relationship between scholarship and physical fitness."[22]

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[19]William A. Cook and Mabel Thompson, "A Comparison of Letter Boys and Non-Letter Boys in a City High School," School Review, 36 (May, 1928), 350.

[20]Ibid., pp. 357.

[21]Dorothy Eaton and J. R. Shannon, "College Careers of High School Athletes and Non-Athletes," School Review, 42 (1934), 356.

[22]Charles D. Giauque, "An Inquiry into the Correlation Between Physical Fitness and Scholastic Standing," Supplement to the Research Quarterly, 6 (March, 1935), 271.

Cormany used different and more select criteria in matching his athletes and non-athletes.[23] The author paired his samples on the basis of school, grade, age and intelligence quotient. In addition, the criteria for scholastic success was selected as results on standardized achievement measures in English, biology and American history. This eliminated, to a large extent, teacher prejudice for or against athletes. The final conclusion was "..... it is striking, if not significant, to find in each case (subgroup of the study) that the trend is in favor of the athlete."[24] Another author that used standardized English tests as criteria for scholastic success was Shannon.[25] This author concluded that "athletes ..... make higher achievement records in proportion to their intelligence than non-athletes."[26]

Culley divided his sample into three classifications for analysis.[27] They were: athletes winning a letter;

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[23]W. J. B. Cormany, "High School Athletics and Scholarship Measured by Achievement Tests," School Review, 43 (June, 1935), 456.

[24]Ibid., pp. 458.

[25]J. R. Shannon, "Scores in English of High School Athletes and Non-Athletes," School Review, 46 (February, 1938), 128.

[26]Ibid., pp. 130.

[27]B. H. Culley, "Athletes and Grades," Phi Delta Kappan, 22 (April, 1940), 383.

athletes not winning a letter; and the general student body. The three groups had practically the same mean intelligence quotient scores. He concluded that athletes did somewhat better so participation ".... did not harm them and .... it may have served as a stimulus to many who otherwise would have been content to let their scholastic achievements ride along." He further concluded that "facts more or less support the claim ..... that the interscholastic program had benefits which were inherent in the program itself and which were not necessarily confined to physical improvement."[28]

Tuttle and Beebee correlated the academic achievements of varsity athletes at the University of Iowa over a six year span with the success of the individual teams as measured by conference finishes and found a correlation of .80.[29] Regarding the scholarship of athletes, the authors found that "scholastic averages in all sports move down during the season of competition."[30] They also concluded that the scholastic attainment of letter winners was approximately equal to the average of the

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[28] Ibid., pp. 389.

[29] W. W. Tuttle and F. S. Beebee, "Study of the Scholastic Attainments of Letter Winners at the State University of Iowa," Research Quarterly, 12 (May, 1941), 174.

[30] Ibid., pp. 180.

male group to which they belonged and that the sports upon which most emphasis was placed ranked lowest in scholastic attainment.

In one of the few studies where some attempt was made to control the courses of study of athletes and non-athletes, Reeder studied the academic records of members of varsity squads in the College of Commerce at Ohio State University.[31] He found that on intelligence tests, athletes and non-athletes were equal at the quartile points and that the grade-point averages at the quartile points were also approximately equal. Athletes had a better record than non-athletes regarding dismissal because of academic problems, but did not do as well during the quarter of competition. He concluded that:

> In this case it is significant that practically one half the group of athletes can work 20-22 hours per week in addition to athletic participation and succeed as well scholastically as the other group that is free from employment and from financial problems. The cumulative ratios are practically identical at the quartile points.[32]

Henning and Carter matched high school athletes and classmates on the basis of school, date of graduation,

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[31] C. W. Reeder, "Academic Performance," Journal of Higher Education, 13 (April, 1942), 204.

[32] Ibid., pp. 207.

high school scholarship, average measured intelligence, reading quotients and college preparatory study load.[33] They found that a significantly larger number of football players than control non-athletes planned to go to college. The measured intelligence quotients and high school grades of non-athletes were slightly superior but the differences were not significant. Football players distributed their courses equally with non-athletes and tended to graduate a slightly higher percentage than the not-athletes. When sixty star athletes were sampled, it was found they did not differ from the other athletes in intelligence or scholastic achievement.

The most recent article reviewed concerned basketball players in the 1960 Iowa sub-state and state tournaments. With fourteen of the sixteen participating schools reporting, Eidsmoe reported that "athletes, such as basketball players, who are highly competitive in their chosen sport are also above the average of their fellow students in academic performance."[34]

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[33] E. J. Henning and H. D. Carter, "Participation in High School Football as a Factor Affecting College Attendance and Scholarship," Journal of Applied Psychology, 29 (June, 1945), 236.

[34] R. M. Eidsmoe, "Facts About the Academic Performance of High School Athletes," Journal of Health, Physical Education and Recreation, 32 (November, 1961), 20.

Probably the most comprehensive survey of the effect of athletic participation on scholastic performance was the one sponsored by the Carnegie Foundation for the Advancement of Teaching and reported by Savage.[35] Fifty two colleges and universities, 2,787 athletes and 11,480 non-athletes were surveyed. In summarizing the results, it can be said that athletes carried a slightly larger number of program hours but that the difference was not significant; that athletes scholastic grades averaged slightly lower than non-athletes, but this was not significant; that a higher proportion of athletes than non-athletes graduate but that it takes the athlete longer; that a slightly higher proportion of athletes than non-athletes incurred probation at some time during the college course, but it was very slight; that wrestlers, cross-country and track men do very well with football and polo players standing at the bottom of the list; that a larger proportion of athletes than non-athletes elected "easy" courses but the same is true, in exactly the same proportions, when considering "hard" courses and that non-athletes did slightly, but not materially, better than athletes on intelligence scores.

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[35]Howard J. Savage, and others, "American College Athletics," (New York: The Carnegie Foundation for the Advancement of Teaching, 1929), pp. 123-25.

In a second survey reported by Savage, thirteen schools tested 4,412 seniors with a standardized examination of general knowledge.[36] The results of this examination showed that 290 athletes averaged over twenty points higher than 1,340 non-athletes but that the difference was not significant. Top scores were turned in by wrestlers and men participating in two or more sports who did slightly better than the athletes as a whole. The author concluded that "athletes have a better intellectual capacity than non-athletes."[37]

SUMMARY OF THE LITERATURE

In summary it might be said that the basic problems recognized in the 1920's are still prevalent in studies attempting to analyze the effect of athletic participation on scholastic grades. They are still ill-controlled and statistical interpretations have very rarely been attempted. Probably more often than not the athlete has suffered a little in the comparison of intelligence quotient scores but not to a significant degree. Regarding the question of scholastic achievement, there are no significant differences between athletes and non-athletes though here the athlete

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[36] Ibid., pp. 125.

[37] Ibid., pp. 127.

tends to show the better scores. Probably the only conclusion that can be drawn from the literature is that no legitimate conclusion is obvious from a perusal of past studies.

CHAPTER III

METHODOLOGY

The purpose of this study was to determine whether participation in varsity athletics had any effect on scholastic performance and whether or not this effect, if any, varied with the sport involved or any other classification.

Experimental Group

The experimental group was composed entirely of athletes, interpreting the term broadly as defined in Chapter I. The time period covered by the study was from September, 1955 through June, 1960. The experimental group was selected by first listing all of the non-transfer athletes who had won letter awards during the period of the study and then recording all of the names that appeared on the various eligibility lists but did not appear as letter winners. The coach of each varsity sport was approached with the names of athletes appearing on the eligibility lists but not appearing on letter-winner lists and asked to indicate who had completed a season of competition without receiving a letter, or who became scholastically ineligible during a season of competition and thereby did not complete the requirements for a varsity award.

In this way, an experimental group composed of all varsity award winners during the period of the study, all students who remained with a team for a full season of competition and any student who would have received an athletic award had he not become scholastically ineligible, was established.

This general method of selecting the experimental group was followed with most of the sub-groups unless otherwise specified. Except in restricted cases, when freshman team members were used as the experimental group and where analyses were made between two groups of athletes, the varsity team members were the experimental group.

Control Group

The control group was matched individual to individual with the experimental group on the basis of year college was begun, major and, where specified, minors. All liberal arts majors or students who indicated that they were undecided were grouped together and results were calculated using these undecided students and also calculated when they were eliminated from the sample.

After the experimental group was determined, the various combinations of major, minors and year starting school were listed. All of the record books for the five years were then examined and all individuals who had corresponding majors and minors for each academic year were

recorded providing they were not transfer students and if they had ACE-T scores available. From this control population, a random sample was selected. Whenever possible an athlete was matched with a non-athlete partner. When there were more non-athletes than athletes meeting a particular set of matching criteria (example: experimental and control individuals with physical education major, health education minor, sociology minor, beginning school in September, 1955), the non-athletes were numbered and the sample that was to be used as control subjects was randomly selected. If more athletes than non-athletes were included, the experimental group was numbered and the sample randomly selected.

The ACE-T scores, honor points and credits attempted for each semester were recorded on a special form devised for this purpose. Summer school sessions were added into the previous semester so the fact that they were summer session classes would exert as little influence as possible. Where comparable semesters appeared (for example, the experimental and control individuals both had first, second, and third semesters in college), the honor point ratio was computed for these semesters.

Computation

The honor point ratio, along with other pertinent

information, was punched into I. B. M. cards and verified. Each card represented one semester of an experimental and control group pair.[1]

The sums of scores, sums of squares and sums of cross products were computed on the I. B. M. 602 calculator. Cards were punched so as to facilitate sub-grouping and these sub-groups were sorted on the I. B. M. card-sorter. The sums of scores, sums of squares and sums of cross-products were then computed for the various sub-groups.

Sub-groups

The sub-groups included: (1) total sample with major course of study specified (2) total sample (3) pressure sports (4) pressure sports with major course of study specified (5) non-pressure sports (6) non- pressure sports with major course of study specified (7) major sports (8) major sports with major course of study specified (9) minor sports (10) minor sports with major course of study specified (11) football (12) football with major course of study specified (13) basketball (14) basketball with major course of study specified (15) baseball (16) baseball with major course of study specified (17) track

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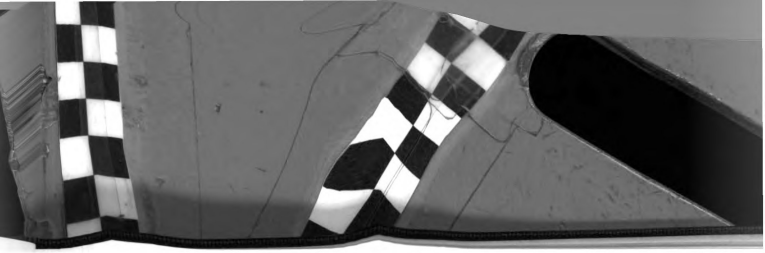
[1]For more details on the I.B.M. programming, see appendices A, B, and C.



(18) track with major course of study specified (19) wrestling (20) wrestling with major course of study specified (21) golf (22) golf with major course of study specified (23) tennis (24) tennis with major course of study specified (25) swimming (26) swimming with major course of study specified (27) gymnastics (28) gymnastics with major course of study specified (29) cross-country (30) cross-country with major course of study specified (31) participants in two or more different sports (32) participants in two or more different sports with major course of study specified (33) freshmen participating on a varsity team (34) freshmen participating on a varsity team with major course of study specified (35) members of pressure sport teams compared with members of non-pressure sport teams (36) members of pressure sport teams with major course of study specified compared with members of non-pressure teams with major course of study specified (37) freshmen on varsity teams compared with freshmen on recognized freshman teams (38) freshmen on varsity teams with major course of study specified compared with freshmen on recognized freshman teams with major course of study specified.

Since the basic reason for matching the athletes and non-athletes was to attempt to equate the courses of study of the two groups, the analysis of covariance was calculated for each group including the undecided individuals and

calculated again eliminating the undecided individuals. Since the undecided group followed, in general, a liberal arts program with a corresponding freedom of election of classes not available in other specialized curricula, it was recognized that the control of programs would be greater when the undecided group was eliminated from the study. Since this group was not eliminated by definition, the analysis was made with and without the followers of the liberal arts program.

In the freshman team-freshman on varsity team analyses, the experimental population consisted of all members of freshman teams (football, basketball, baseball and track) who were not transfers and had ACE-T scores available. The control group was composed of freshmen on varsity teams. The same procedure for random matching of the two groups that was used for the other parts of the study was used in this analysis.

In the pressure sport-non pressure sport comparisons, the experimental group refers to the varsity football and basketball team members while their matched partners were selected from varsity team members of the other sports. The same method of matching was used as in previous sections of the study.

Statistical Treatment

The analysis of covariance followed the pattern established by McNemar with the normally distributed honor point ratio as the independent variable and the rectangularly distributed ACE-T score as the dependent variable.[2] Statistical significance was selected to be at the five per cent level of confidence.

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[2]Quinn McNemar, Psychological Statistics (New York: John Wiley and Sons, Inc., 1949), Chapter 15.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to determine if participation in varsity athletics at Central Michigan University had any beneficial or detrimental effect on scholastic success. In addition, it was desired to look at individual sports and various combinations of sports to differentiate between their individual effects.

RESULTS

Aptitude and Honor Point Ratio of Athletes

Table I shows the mean and median ACE -T scores of all members of the experimental (athlete) population. Since the ACE-T results are recorded as percentile rank scores based on local norms, it may be assumed that the mean ACE-T score for the student population is fifty. It can be seen that the median score of one sport equals the theoretical mean of the student body; four teams exceed and six are inferior to the theoretical mean. On the basis of mean scores for the various sports, the ACE-T of five exceeded the student body mean and the ACE-T of six were inferior. The only mean that might be considered extreme is golf (29.73) and the only medians are swimming (71) and golf (25).

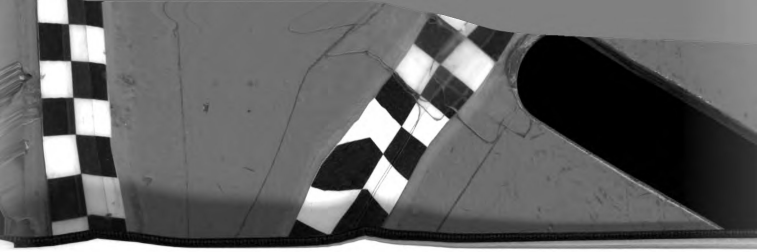


TABLE I

COLLEGE APTITUDE OF ATHLETES AS MEASURED BY ACE-T SCORES

Sport		Mean ACE-T Score	Median ACE-T Score
Swimming	23	57.35	71
Track	47	54.19	56
Cross-country	24	52.96	50
Wrestling	39	52.85	59
Basketball	26	51.65	52
Gymnastics	16	48.69	45
Two or More	44	47.50	47
Football	61	46.62	47
Tennis	11	45.00	48
Baseball	33	44.97	40
Golf	11	29.73	25

The honor point ratios for the various sports populations, based on a four point system, are shown in Table II. Although these scores might be considered fairly low, it must be pointed out that the populations and, later, the samples, are heavily loaded with freshmen and sophomores as there are five freshman and four sophomore classes to select from but only two senior classes due to the method of selecting the experimental subjects. Since it is reasonable to assume that a process of elimination of weaker students takes place in the first two years of school, upper class scholastic attainment should be higher than the attainment of underclassmen. Therefore, the grades of any group dominated by freshmen and sophomores will be lower than grades of groups more normally composed. In the sampling done from this population, the means of ten samples selected exceeded corresponding population means, the means of ten samples were inferior to the corresponding population means and, in two groups, the sample and population means were equal.

Curricula of Athletes

As might reasonably be expected, more athletes major in physical education than any other field except the undecided and liberal arts combination. In Table III, the various athlete majors are broken down in a year by year

TABLE II

ACADEMIC SUCCESS OF COLLEGE ATHLETES

Sport	Number	Mean Honor Point Average	Median Honor Point Average
Cross-country	24	2.42	2.33
Wrestling	39	2.38	2.35
Baseball	33	2.37	2.33
Two or More	44	2.36	2.27
Track	47	2.34	2.31
Tennis	11	2.28	2.28
Basketball	26	2.23	2.25
Golf	11	2.20	2.10
Swimming	23	2.19	2.25
Football	61	2.16	2.19
Gymnastics	16	2.03	2.06

compilation. No discernible trend is apparent though a smaller number of athletes seemed to be majoring in physical education during the latter two years of the study. However, this may well be due to the method of selection of the experimental group and the heavy concentration of freshmen and sophomores, especially during these two years.

The minors of athletes are indicated in Table IV. The heavy emphasis in health education during the period of the study is partially explained by the fact that during the first four years of the study a health education minor was virtually required for anyone taking a physical education major.

Analysis of Results

The results of the analysis of covariance, holding constant the effect of college aptitude and analyzing for significance of difference in mean honor point average, are presented in Tables V through XXIII. In Table V, the total population of athletes that could be matched with non-athletes is compared.

The left hand comparison includes those who did not indicate a major or minor while the second comparison is only for those indicating a major curriculum. This is the sequence that will be followed for the remainder of the tables through Table XXIII. It should be noted in the

TABLE III

MAJOR FIELDS OF STUDY OF ATHLETES

Subject	Year 1955-56	1956-57	1957-58	1958-59	1959-60	Total
Accounting		1		3		4
Art		1				1
Biology	2	3	1	1	1	8
Business Adm.	1	1		3		5
Chemistry	1					1
Commerce	4	3	3	2		12
Economics	2					2
English				1		1
Geography		1	1			2
History		3	1	2	1	7
Ind. Arts	7		5	1	2	15
Liberal Arts	7	8	15	26	36	92
Mathematics	2	2	2	4	1	11
Physical Educ.	14	16	19	7	3	59
Pre-Engineering			3	1		4
Pre Medicine		1				1
Social Sciences	1	4	2			7
Sociology	2	3		1		6
Speech			2			2
Totals	43	47	54	52	44	240

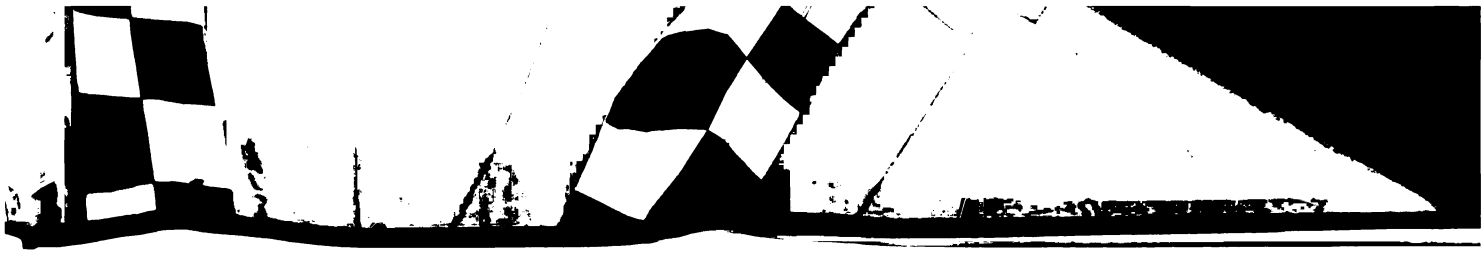


TABLE IV

MINOR FIELDS OF STUDY OF ATHLETES

Subject	Year 1955-56	1956-57	1957-58	1958-59	1959-60	Total
Art	1		1			2
Biology	3	3	1	1	1	9
Chemistry	2					2
Commerce	3			1		4
Economics	7	4	3	4		18
English		1	1			2
French				2		2
Geography		7	3	4	1	15
Health Educ.	14	13	19	3		49
History	4	10	5	2		21
Ind. Arts	7	2	6	2		17
Mathematics	3	3	1			7
Physical Educ.	12	13	7	7	4	43
Physical Science	1	1		1		3
Political Sci.		3				3
Psychology	1	1				2
Recreation	1		1	1		3
Sociology	7	5				12
Spanish	1					1
Speech	3	1	1			5
Totals	70	67	49	28	6	220

over-all comparison that the experimental (athlete) group has a substantially higher honor point ratio (0.13) in spite of the fact that they show somewhat lower college aptitude. The athletes performance is statistically significantly better.

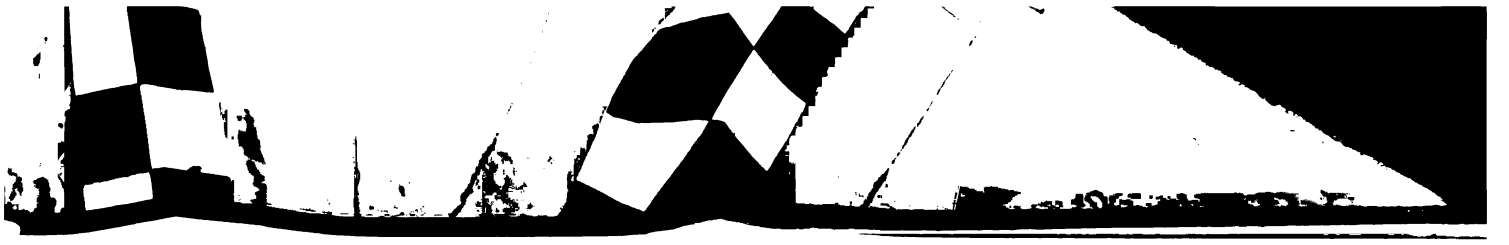
TABLE V

COMPARISON OF MEAN HONOR POINT RATIOS OF ATHLETES AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.22	2.09	2.28	2.15
ACE-T Score	50.03	52.78	44.04	47.67
Number*	842		520	
F-ratio	13.738		12.500	
Significance Level	.001		.001	

*Number is the total number of individual semesters in the experimental and control groups. The total number of semesters contributed by athletes is N ÷ 2. In all subsequent tables this will be the case.

Table VI analyzes the effect of participation in the pressure sports (football and basketball). Very little difference in mean honor point average is present and, when the undecided group is eliminated, the experimental group changes from a superior honor point average to an inferior honor point average when comparing it with the control group. In both instances, however, the athletes have a lower ACE-T score.



The next analysis shows what might logically be deduced after the first two analyses are studied.

TABLE VI

COMPARISON OF MEAN HONOR POINT RATIOS OF PRESSURE SPORT ATHLETES AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.09	2.04	2.13	2.16
ACE-T Score	43.49	52.69	31.94	47.19
Number	274		154	
F-ratio	1.150		0.065	
Significance Level	None		None	

In the non-pressure sport comparisons (Table VII), the athletes perform significantly better than the control group (0.18 honor points per semester higher) with a somewhat lower college aptitude.

TABLE VII

COMPARISON OF MEAN HONOR POINT RATIOS OF NON-PRESSURE SPORT ATHLETES AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.28	2.10	2.34	2.14
ACE-T Score	51.39	52.69	46.27	47.47
Number	616		406	
F-ratio	16.467		17.600	
Significance Level	.001		.001	

The F-ratio for the non-pressure sport group with major specified is the highest of the entire study and is significant at well above the .001 level of confidence.

In the direct comparison between pressure and non-pressure sports, no significant difference was found (see Table VIII).

TABLE VIII

COMPARISON OF MEAN HONOR POINT RATIOS OF PRESSURE SPORT ATHLETES AND NON-PRESSURE SPORT ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.18	2.28	2.23	2.40
ACE-T Score	54.37	53.48	46.06	46.62
Number*	204		94	
F-ratio	2.655		3.143	
Significance Level	None		None	

*The number referred to here and in future tables varies from corresponding numbers in Tables I and II (pages 33 and 35). There are two reasons for this. First, the number here refers to semesters while the number in Tables I and II refers to individuals. Second, certain members of the population have been lost before these analyses due to the investigators inability to match non-athletes to their curricula.

Note: The experimental group is the pressure sport group.

In both instances, the non-pressure group had slightly higher college aptitude scores and somewhat higher honor point averages.

When track and baseball are added to the pressure sports to form the major sport category, a somewhat different picture emerged due possibly to the effect of the performance of the track athletes. With a lower ACE-T score, the experimental group performed better to a significant degree than the control members. This is summarized in Table IX.

TABLE IX

COMPARISON OF MEAN HONOR POINT RATIOS OF MAJOR SPORT ATHLETES AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.19	2.05	2.28	2.15
ACE-T Score	51.98	51.92	46.05	49.31
Number	452		260	
F-ratio	7.590		5.564	
Significance Level	.01		.05	

In spite of this improvement of the performance of the experimental group from the pressure sport combination to the major sport combination, it did not appreciably reduce the academic attainment of the minor sports participants (Table X). Their performance was even more statistically significant than the major sports,

In the first three major sports (football, Table XI; basketball, Table XII; and baseball, Table XIII), no significant difference in academic achievement can be found.

TABLE XII

COMPARISON OF MEAN HONOR POINT RATIOS OF BASKETBALL SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.15	1.99	2.06	2.29
ACE-T Score	49.79	57.21	36.95	60.16
Number	86		42	
F-ratio	2.570		0.880	
Significance Level	None		None	

TABLE XIII

COMPARISON OF MEAN HONOR POINT RATIOS OF BASEBALL SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.32	2.25	2.38	2.22
ACE-T Score	48.80	48.93	37.32	44.85
Number	108		68	
F-ratio	0.630		2.210	
Significance Level	None		None	

At this point it should be pointed out that in all of the athlete - non-athlete comparisons from Table V through Table XIII, the mean honor point average of the group that selected their major course of study was higher than the mean honor point average of those in the group who were undecided. This happened in spite of the fact that the individuals specifying a major also had lower college aptitude scores whether the group being considered was athlete or non-athlete.

Track participants gave one of the six significant F-ratios. Table XIV shows that the total track group comparison resulted in a highly significant difference in honor point averages with the advantage being in favor of athletic participation.

TABLE XIV

COMPARISON OF MEAN HONOR POINT RATIOS OF TRACK SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.36	1.95	2.49	2.13
ACE-T Score	60.75	48.21	58.96	43.00
Number	144		92	
F-ratio	8.880		2.570	
Significance Level	.01		None	

Among the minor sports, cross-country (Table XVI) and wrestling (Table XV) showed significant positive values for athletic participation with wrestling showing the highest level of significance of any sport, major or minor.

TABLE XV

COMPARISON OF MEAN HONOR POINT RATIOS OF WRESTLING SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.34	2.13	2.45	2.07
ACE-T Scores	49.82	61.63	49.45	52.02
Number	152		102	
F-ratio	8.710		15.540	
Significance Level	.01		.001	

TABLE XVI

COMPARISON OF MEAN HONOR POINT RATIOS OF CROSS-COUNTRY SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.46	2.09	2.57	2.16
ACE-T Scores	61.02	46.96	58.83	44.33
Number	96		72	
F-ratio	4.164		4.730	
Significance Level	.05		.05	

Matched with a group that had far above average college aptitude, the cross-country athlete still managed to have superior honor point averages regardless of the method of analysis used.

The only other sport to show a significant difference in mean honor point average was tennis (Table XVII).

TABLE XVII

COMPARISON OF MEAN HONOR POINT RATIOS OF TENNIS SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.28	2.12	2.25	1.99
ACE-T Score	51.89	74.53	45.40	72.40
Number	36		20	
F-ratio	3.410		8.320	
Significance Level	None		.05	

The investigator believes that this points up one of the noted limitations of a study using a semester by semester comparison.[1] One person in the experimental group and one in the control group dominated this comparison, contributing sixteen of the twenty equated semesters. Therefore, in small samples, the semester by semester comparison technique

[1]See Chapter I, pg 6.

leads to some conclusions that may not be justifiable even though they are statistically acceptable. In the larger samples, this has been negated to a large extent but in small samples it is a serious problem.

The remaining sports (swimming, Table XVIII; gymnastics, Table XIX; and golf, Table XX) showed no significant differences. Swimmers tended to do much better than their control members but their aptitude for academic work also seemed to be higher.

TABLE XVIII

COMPARISON OF MEAN HONOR POINT RATIOS OF SWIMMING SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.26	2.00	2.26	1.97
ACE-T Scores	60.67	41.87	55.63	20.25
Number	78		32	
F-ratio	2.520		0.100	
Significance Level	None		None	

Gymnastic team members did a little poorer than their non-athlete partners. This was one of the few instances when the athletes had lower grades than their control.

TABLE XIX

COMPARISON OF MEAN HONOR POINT RATIOS OF GYMNASTIC SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	1.90	1.93	2.00	2.00
ACE-T Scores	40.86	52.93	43.38	52.38
Number	28		26	
F-ratio	0.890		0.710	
Significance Level	None		None	

Golfers had the poorest honor point average recorded when comparing it with their control group.

TABLE XX

COMPARISON OF MEAN HONOR POINT RATIOS OF GOLF SQUAD MEMBERS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.11	2.38	2.12	2.40
ACE-T Score	33.63	54.89	28.48	57.92
Number	54		50	
F-ratio	1.480		0.330	
Significance Level	None		None	

For athletes that participated in more than one sport, athletic participation seemed, at a high level of significance, to lead to better scholarship (see Table XXI).

TABLE XXI

COMPARISON OF MEAN HONOR POINT RATIOS OF ATHLETES PARTICIPATING IN TWO OR MORE SPORTS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.44	2.06	2.51	2.11
ACE-T Score	51.45	50.02	45.40	45.80
Number	128		100	
F-ratio	14.230		15.810	
Significance Level	.001		.001	

There is a slight weakness in this summary that should be pointed out. Over one-third of the athletes in this sub-group came from the combination of track and cross-country. Since the representatives of these sports performed well academically as individual sports, it might be anticipated that this would occur.

The final analysis concerned the effect of athletic participation on freshmen. In comparing freshmen participating on varsity athletic teams with non-athletes (Table XXII), the athletes do significantly superior work during their freshman year with lower aptitude scores. However,

when comparing freshmen athletes on varsity teams with freshmen athletes from freshman teams (Table XXIII), there was no significant difference though the varsity athletes had slightly higher honor point averages and in one case superior and one case inferior college aptitude scores.

TABLE XXII

COMPARISON OF MEAN HONOR POINT RATIOS OF FRESHMEN COMPETING ON VARSITY TEAMS AND NON-ATHLETES

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.07	1.93	2.10	1.97
ACE-T Score	51.74	54.90	43.14	47.03
Number	486		236	
F-ratio	9.470		5.080	
Significance Level	.01		.05	

TABLE XXIII

COMPARISON OF MEAN HONOR POINT RATIOS OF FRESHMEN COMPETING ON VARSITY TEAMS AND FRESHMEN ON FRESHMAN TEAMS

	Including Undecided		Major Specified	
	Experimental	Control	Experimental	Control
Honor Point	2.04	1.88	2.12	2.03
ACE-T Score	54.26	45.98	44.62	48.86
Number	204		58	
F-ratio	2.042		0.920	
Significance Level	None		None	

II. DISCUSSION

To attempt to hypothesize the reasons for the results obtained from these data is very difficult because of the many factors that can enter into a study of this type. There was only limited control of the matching procedure and in spite of the occasional large "N", in many cases the total number of athletes and their non-athlete partners involved is comparatively small.

The majors and minors seem to be about normally distributed for the athlete population with the exception of a strong emphasis in physical education. However, since the athlete is obviously highly skilled in at least one, and probably more, physical education activity, it would seem natural to find him majoring in a field where he has an above average level of ability. Certainly it does not surprise one to find a talented artist majoring in art or a talented celloist majoring in music. Yet, there seems to be a tendency for people to look askance at the talented athlete majoring in physical education.

To find a level of significance as high as was found in the direct athlete - non-athlete comparisons was very unusual in this type of a study. This may have been because of the experimental design - a semester by semester comparison rather than an individual-to-individual comparison.

The semester comparison led to a larger number and a smaller F-ratio requirement for a particular level of significance.

A second reason for this comparatively high level of significance was the statistical technique used. By an analysis of covariance, the effect of college aptitude was eliminated. On the basis of an informal pilot study conducted by the investigator, it was expected this statistical technique would be a hinderance to obtaining statistical significance though it would be a more valid indication of the true situation. However, this did not turn out to be the case. In fact, this technique tended to emphasize the significance of the difference in means.

Why athletics should contribute to scholastic success is an interesting question. Certainly athletics are time consuming and it would be expected that this might be detrimental to good scholarship. However, based on the data in this study, it would appear that athletics contribute positively to academic achievement. Two possible explanations appear to be reasonable and they will be discussed briefly.

First, athletics, because of the eligibility requirements and other awards for combinations of good scholarship and athletic ability, have built-in inducements for academic achievement. A boy knows he must maintain acceptable grades if he desires to compete. As a result, he has an additional

incentive to work toward his academic potential. This is, to be sure, an artificial stimulus but if one accepts this hypothesis, it is probably a stimulus that is justified on the basis of its results.

The second explanation concerns the counseling that the athlete receives. In spite of a very fine group of counselors at Central Michigan University, the fact remains that the counselor-counselee ratio is very large. A coach, on the other hand, is involved in advising only twelve to fifty students. In the case of the larger numbers, very often more than one person is involved in coaching the sport and therefore the ratio may be even smaller than might be expected.

In discussing the academic success of individual sports, possible explanations for the performance of different squads can be advanced. The fine showing of the cross-country team may have been due to its relatively short season and probably was also due to the relatively high college aptitude. The baseball and wrestling coaches have been trained in counseling and this may be a reason for their success. Wrestling also showed good college potential. On the other end of the scale, gymnastics has by far the longest season and also the coach with the least professional preparation. The problem of football may be explained by the position of its season. The fact that it comes so early in

the school year may be detrimental. However, it is to be remembered that cross-country occupies the same relative time position in the school year.

A definite distinction arose when the influence of pressure and non-pressure sports on academic performance was considered. Certainly there can be little doubt that the results indicated very strongly that participation in non-pressure sports tended to encourage good scholarship. On the other hand, this was not the case with the pressure sports. When the scholastic aptitude of the football team was observed, it proved to be relatively low. On the basis of numbers, football dominated the pressure sports. Football, of course, comes early in the school year beginning before school even opens. Did this prevent boys from getting off to the "good start" many people feel is so necessary? Once again, it must be remembered it is difficult to rationalize the performance of cross-country runners if this was the case. Certainly when comparing pressure and non-pressure sports directly, no claim of statistical significance could be made though the data once again tended to favor participation in the non-pressure sports. This poses another question. Is it the nature of the sport, the type of individual involved, the external pressures that are greater in these sports (certainly the internal pressures are no different), or any of a number other possible

explanations that caused these differences? In the opinion of the investigator, these questions and the ones involving the participation of freshmen on varsity teams were the most interesting parts of the study.

Individually, the performance of the track, cross-country and wrestling teams was splendid. To attempt to give possible explanations for this would be difficult. Perhaps it was simply a lucky five year run of athletes. However, because of the relatively large number of cases, this is a difficult hypothesis to justify. It is interesting to note that these are what are basically referred to as individual sports. Does this perhaps have some bearing on the results? Certainly much more information is needed in this area.

One of the more intriguing sub-group statistics involved the athletes participating in two or more sports. Actually, in the study, only one man participated in three seasons of competition and he did this for only one year. The partial explanation based on the fact that many of the individuals involved doubled in track and cross-country has already been discussed. However, this does not give an adequate explanation as to why it occurred. Possibly the only general hypothesis that might stand up is the theory that the athlete so involved will better organize his time or that it is the nature of the individual who would

attempt to participate in two varsity sports, to work closer to his capacities than his control partner.

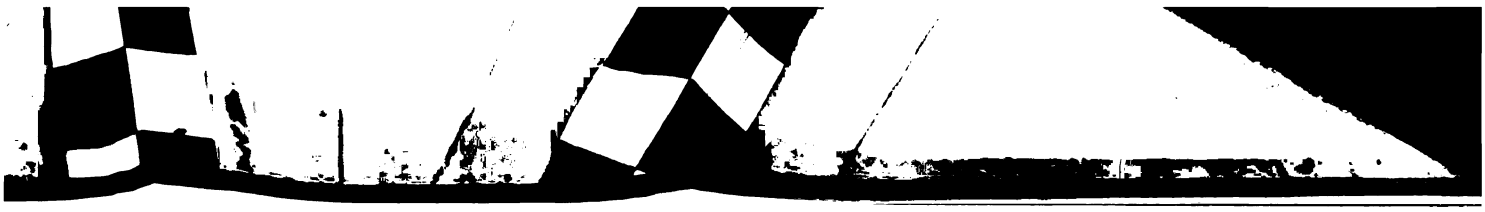
The question of the advisability of allowing freshmen to participate in varsity competition has frequently arisen. In some colleges it has not been practical to attempt to field representative teams without using freshmen. In others, usually the larger schools, the tradition has grown that freshmen should "get adjusted" to college life before embarking on an athletic career. Yet, these same people who are against freshmen competing on varsity teams condone the participation of freshmen on freshman teams where coaches may not be as well trained and where practice times are often inconvenient. Also, the participation of freshmen in band, debate, chorus, student publications and many other activities is rarely, if ever, questioned. The interesting point in the freshman results is that freshmen participating on varsity teams did better than the regular college freshmen. This was significant regardless of the method of sampling. When they were compared with freshman teams, the freshmen on the varsity, with approximately equal college aptitude, did not do significantly superior work. The explanation involving counseling by coaches fits nicely in this particular phase of the study. Most college counselors believe that the first two semesters are exceedingly important.

Certainly the college counselors were overworked during orientation week when schedules were made up by the freshmen. At this point, the student who worked closely with his coach was able to get more individual help. In addition, most coaches already had working knowledge of the boy's background, family, financial status, past academic success and other information that assisted him in helping the boy in the selection of classes. In addition, this explanation may help explain the advantage the varsity athlete had over the freshman athlete who was on a freshman team. Very few "unknowns" will make a varsity team as a freshman. Therefore, the coach generally knew with whom he had to work. Somewhat more often, a boy who had not been recruited made a freshman team. Since this boy was unknown up to the time he tried out, he had not received any more than normal university counseling. This may in part explain the superiority of the freshman on the varsity over the freshman participating on the freshman teams.

One of the more interesting points is the fact that a cursory glance at the data indicated that the athletes, as a group, were below their non-athlete counterparts in general college ability. Would these statistics stand up if the athletes had greater college aptitude?

Finally, the fact that the group that selected a major did somewhat better, in most cases, in spite of the

handicap of lower college aptitude is of interest. No statistical treatment was performed on this data but it is interesting for further study. Does this mean that the student who goes to college knowing where he is going has a better chance to succeed? It would seem logical to assume so. However, why does he score lower on the college aptitude test? This and many other questions that have arisen can only be answered by further studies in this area.



CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to determine if participation in varsity athletics at Central Michigan University had any beneficial or adverse effect on scholastic success. To pursue this problem, athletes and non-athletes were matched on the basis of major, minor(s) and year they started school. By an analysis of covariance technique, the college aptitude of each pair was equated and an analysis of difference in mean honor point average was made. The comparison was a semester-by-semester comparison rather than an individual-to-individual comparison.

I. FINDINGS

The total group, non-pressure sport group, minor sport group, two-or-more sports group and the wrestling group showed highly significant results (.001 level of confidence) favoring athletic participation. Other subgroups that showed significant results included: major sports, track, wrestling (when the liberal arts students were included), tennis, cross-country and freshmen participating on varsity teams. F-ratios varied from a low of 0.044 for football to a high of 17.600 for the non-

pressure sports with major specified.[1]

II. CONCLUSIONS

On the basis of this study, the following conclusions seem justified at Central Michigan University:

1. Athletic participation does not have any detrimental effect on scholastic success.

2. Track, wrestling and cross-country participants and non-pressure sport participants show the highest levels of scholastic success of any of the sub-groups.

3. All significant results are in favor of athletic participation. Virtually all of the non-significant results, also tended to favor the athletic participants.

4. Freshman participation on a varsity athletic team did not have a detrimental effect on scholastic success.

III. LIMITATIONS

The limitations of this study that should be noted include the disadvantages of a semester-by-semester comparison. The major weakness of this type of research is that, in small samples, one individual may bias the results by contributing a disproportionate share of the semesters.

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[1]See Table XXIV, Appendix D, pg. 72.

However, this bias can work to the advantage of either the control or the experimental group.

Various other factors have not been controlled but the major areas of weaknesses of previous studies have been eliminated by the sampling procedure and by the statistical technique employed.

IV. RECOMMENDATIONS

On the basis of the results and conclusions of this study, it seems justifiable to make a number of recommendations.

This study was restricted to Central Michigan University. It would seem to be desirable and important that other similar studies be conducted in similar institutions; in larger institutions with "big-time" athletic programs; in smaller institutions and others with different philosophical backgrounds.

The question of freshmen participating on athletic teams has long been a subject of considerable debate. One of the arguments against freshmen participating has been that their scholastic performance was poorer as a result of this participation. From the results of this study, this does not appear to be the case at Central Michigan University. In fact, the opposite is apparently true. It therefore is recommended that the question of freshmen

participating on varsity teams be examined more closely and other arguments analyzed objectively. If the arguments are substantiated, then, if applicable, they should be examined in relation to other non-curricular activities. If they do not stand up to objective evaluation, then the National Collegiate Athletic Association and other governing bodies should again evaluate the restriction on freshman participation.

The scholarship potential of athletes seemed to be a little below average. The reasons for this should be examined jointly by the athletic department and the school administration with an eye to improving the already adequate scholastic performance of Central Michigan University athletes. Various individual opinions have already been voiced by the athletic staff. Some merit investigation.

In summary, much research is needed in this area to dispel personal prejudices both pro and con collegiate athletics. At Central, and no doubt at many other institutions, research of this type will become easier in the future as more and more records will be kept on I.B.M. cards. Certainly the least enjoyable and most time consuming part of any research of this type is the hand sorting and recording of record books and data. I.B.M. and other comparable systems will make this type of much needed research easier and more challenging to future investigators.

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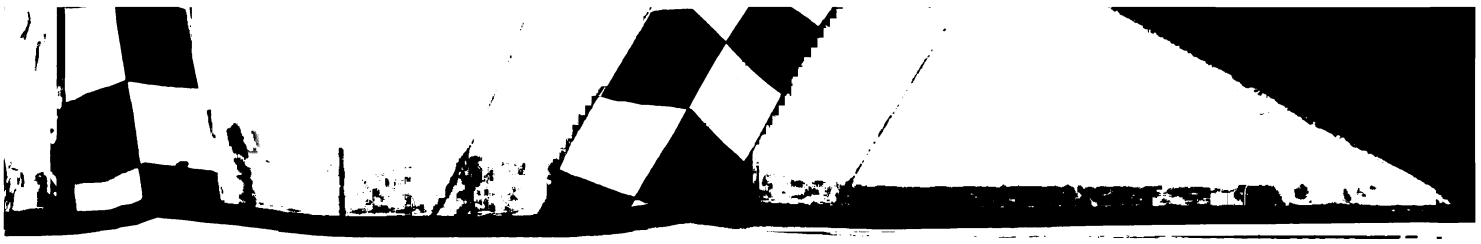

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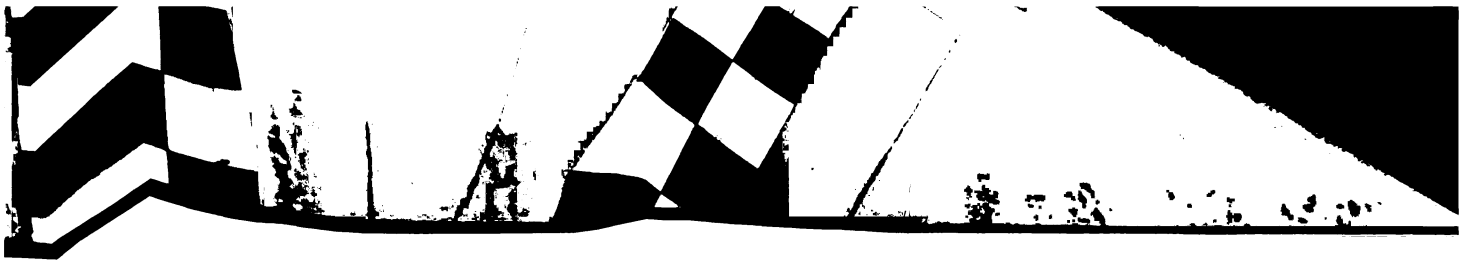
APPENDIX

APPENDIX A

PROGRAMMING OF I. B. M. CARD

Column	Program
1	Identification number
2	Identification number
3	Identification number
4	Last digit of year in which school was begun
5	Sport: Wrestling (1); Golf (2); Tennis (3); Baseball (4); Football (5); Basketball (6); Swimming (7); Gymnastics (8); Track (9); Cross-country (0).
6	ACE-T score of athlete
7	ACE-T score of athlete
8	Honor point average of athlete
9	Honor point average of athlete
10	Honor point average of athlete
11	Major course of study (see Appendix B)
12	Major course of study (see Appendix B)
13	First minor course of study (see Appendix C)
14	First minor course of study (see Appendix C)
15	Second minor course of study (see Appendix C)
16	Second minor course of study (see Appendix C)
17	Is this a freshman semester of varsity competition? 1 equals a yes and 2 equals a no.
18	ACE-T score of control
19	ACE-T score of control
20	Honor point average of control
21	Honor point average of control
22	Honor point average of control
23	Is this a duplicate card except for column 5? 1 equals a yes.



APPENDIX B

CODIFICATION FOR MAJORS

Code Number	Major
01	Accounting
02	Biology
03	Business Administration
04	Chemistry
05	Commerce
06	Economics
07	English
08	Geography
09	History
10	Industrial Arts
11	Liberal Arts
12	Mathematics
13	Physical Education
14	Pre-Engineering
15	Pre-Medicine
16	Social Science
17	Sociology
18	Speech
19	Art

APPENDIX C

CODIFICATION FOR MINORS

Code Number	Minor
01	Art
02	Biology
03	Chemistry
04	Commerce
05	Economics
06	English
07	French
08	Geography
09	Health Education
10	History
11	Industrial Arts
12	Mathematics
13	Physical Education
14	Physical Science
15	Political Science
16	Psychology
17	Recreation
18	Sociology
19	Spanish
20	Speech

APPENDIX D

TABLE XXIV

SUMMARY OF RESULTS

Group	N	Mean HPA Exp.	Mean HPA Cont	Mean ACE Expe.	Mean ACE Cont.	F-ratio	Level of Signif.
Total	842	2.22	2.09	50.03	52.78	13.738	.001
Total w/mjr	520	2.28	2.15	44.04	47.67	12.500	.001
Pressure Sports	274	2.09	2.04	43.49	52.69	1.150	None
Press. Spts w/mjr	154	2.13	2.16	31.94	47.19	0.065	None
Non-Pres. Sports	616	2.28	2.10	51.39	52.69	16.467	.001
N-P Spts w/mjr	406	2.34	2.14	46.27	47.47	17.600	.001
Press Spt-N.P.	204	2.17	2.28	54.37	53.48	2.655	None
P-Non P. w/mjr	94	2.23	2.40	46.06	46.62	3.143	None
Major Sport	452	2.19	2.05	51.98	51.92	7.590	.01
Major Sport w.mjr	260	2.28	2.15	46.05	49.31	5.564	.05
Minor Sport	444	2.29	2.11	51.78	54.67	13.375	.001
Minor Sport w/mjr	302	2.35	2.12	48.08	49.18	16.870	.001
Football	192	2.06	2.06	39.97	50.82	0.044	None
Football w/mjr	116	2.16	2.09	29.36	42.97	0.836	None
Basketball	86	2.15	1.99	49.79	57.21	2.570	None
Basketball w/mjr	42	2.06	2.29	36.95	60.10	0.880	None
Baseball	108	2.32	2.25	48.80	48.93	0.630	None
Baseball w/mjr	68	2.38	2.22	37.32	44.85	2.210	None
Track	144	2.36	1.95	60.75	48.21	8.880	.01
Track w/mjr	92	2.48	2.13	58.96	43.00	2.570	None
Wrestling	152	2.34	2.13	49.82	61.63	8.710	.01
Wrestling w/mjr	102	2.45	2.07	49.45	52.02	15.540	.001
Golf	54	2.11	2.38	33.63	54.89	1.480	None
Golf w/mjr	50	2.12	2.40	28.48	57.92	0.330	None
Tennis	36	2.28	2.12	51.89	74.53	3.410	None
Tennis w/mjr	20	2.25	1.99	45.40	72.40	8.320	.05

TABLE XXIV (continued)

Group	N	Mean HPT Exp.	Cont	Mean ACE Expe.	Cont.	F-ratio	Level of Signif.
Swimming	78	2.26	2.00	60.67	41.87	2.520	None
Swimming w/mjr	32	2.26	1.97	55.63	20.22	0.100	None
Gymnastics	28	1.90	1.93	40.86	52.93	0.890	None
Gymnastics w/mjr	26	2.00	2.00	43.38	52.38	0.710	None
Cross-country	96	2.46	2.09	61.02	46.96	4.164	.05
X-country w/mjr	72	2.57	2.16	58.83	44.33	4.730	.05
Two or more spts	128	2.44	2.06	51.45	50.02	14.250	.001
Two plus w/mjr	100	2.51	2.11	45.40	45.80	15.810	.001
Frosh on varsity	486	2.07	1.93	51.74	54.90	9.470	.01
Fr on vars w/mjr	236	2.10	1.97	43.14	47.03	5.080	.05
Fr on vars-Fr team	204	2.04	1.88	54.26	45.98	2.042	None
Fr-Fr team w/mjr	58	2.12	2.03	44.62	48.86	0.920	None