

A STUDY OF THE SCHOLARSHIP OF PARTICIPANTS AND NON-
PARTICIPANTS IN THE EXTRA-CURRICULAR PROGRAM AS
SET UP BY THE DEPARTMENT OF PHYSICAL EDUCA-
TION FOR WOMEN, UNIVERSITY OF ARIZONA

by

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CHAPTER I

INTRODUCTION

Common Conceptions Regarding an Extra-Curricular Athletic Program

Of all the extra-curricular activities offered students in a college or university perhaps no other has as many aspersions cast upon it as the athletic program. There is no one who has not been guilty at some time or other of stating that all athletes are "dumb." It seems to be common opinion that persons participating in the athletic program are inferior mentally to persons participating in other extra-curricular activities. This assumption of inferior mentality seems rarely to be placed on the participants of debate, dramatics, music or other extra-curricular activities.

Another common conception of an extra-curricular athletic program is that it demands an excessive amount of time and energy on the part of the students participating. This conception of a women's athletic program is perhaps a carry-over from the time when women engaged in strenuous intercollegiate competition.

Whenever an "extra-curricular athletic program" is mentioned people immediately think of an intercollegiate

program such as the football, basketball or track programs carried on by men in colleges and universities. Few people realize that there are various types of extra-curricular athletic programs. One type has already been mentioned--the intercollegiate program as carried on by men. This is the program people follow by reading the sport pages of newspapers. This intercollegiate program is still used by men but there are very few schools offering an intercollegiate athletic program for women. This old type of program has been replaced with the newer one of "intramural athletics." The intramural program for women is used exclusively at the University of Arizona and is discussed in detail later in this study.

In considering women who participate in women's athletics people are very prone to think of a large, masculine, "tomboy" type of woman whose only ambition is to break a discus record, or to throw a baseball farther than any other woman has thrown it. If such conceptions have had a true basis it has been in past history. The fact really is that the participant of today's extra-curricular athletic program for women is a truly feminine person who participates for the enjoyment of play, the desire for activity, the relaxation from academic work and for the highly prized contacts made with other women on the playing field. It is no uncommon occurrence to find a woman, who has played

in an afternoon hockey game, in the receiving line of a reception in the evening, or as a dinner hostess at a sorority or dormitory.

These common conceptions are a few of the things ever in the minds of the directors of the extra-curricular athletic programs for women. Every effort to dispel such wrong conceptions in the minds of the laymen is being made by those actively engaged in promoting extra-curricular athletic programs for women. This study of the scholastic achievements of participants and non-participants in the extra-curricular athletic program for women at the University of Arizona was made as a small contribution to this gigantic task faced by the leaders of athletic programs for women.

Review of Related Studies

Although the common assumption is that athletes or participants in an extra-curricular athletic program have lower academic scholarship standings than non-participants, there have been comparatively few studies made in this field. The studies that have been made have dealt exclusively with men and boys in various colleges and high schools. There are no published studies or surveys on the scholarship and participation of women which are available for use in studying this problem.

Davis and Cooper write:

"About thirty years ago the first of studies devoted to discovering the facts related to this problem (Athletic Ability and Scholarship) was conducted at Amherst College. In this instance, the athletes appeared less favourably. However since that time over forty similar studies have been pursued in the secondary schools, colleges and universities, with conflicting results."¹

A footnote in the same article states:

"New York Times, March 17, 1934 states that twelve of the nineteen men at Amherst College this winter elected to Phi Beta Kappa were athletes."²

Hindman reports in his study at the Ohio State University:

"Among evils commonly attributed to athletics by the one party (people demanding changes in our present athletic set-up) and denied by the other, none is more often mentioned than a retarding effect upon the scholarship of athletes, and in probably no case is the arguing based more on opinion and less on knowledge."³

The outstanding study made on this problem was a survey of university and college men made by Howard J. Savage and published in the 22nd Annual Report of the Carnegie Foundation for the Advancement of Teaching.

"It has become a commonplace of the adverse criticism passed upon American college athletics that they weaken the intellectual spirit and lower the academic standing of the undergraduate."⁴

1. Davis, E. G. and Cooper, J. A. "Athletic Ability and Scholarship." Physical Education Research Quarterly, 5:68-78 (Dec. 1934).
2. Ibid.
3. Hindman, Darwin. "Athletics and Scholarship at Ohio State University." School and Society, 30:93-96 (July 20, 1929).
4. Savage, Howard J. "College Athletics and Scholarship." 22nd Annual Report of the Carnegie Foundation for the Advancement of Teaching.

With such far-flung and common beliefs it is to be imagined that the results of this study would substantiate such beliefs. However, the opposite was true. Savage reported that in some schools the non-participants excelled the participants in scholarship but in other institutions the participants had the highest scholastic standings.

At Rutgers Fowlkes found the following results:

"College students who participate in athletics do not suffer scholastically because of their sports according to the results of a survey at Rutgers.

"Athletes received a higher grade average during the four years than the non-athletes.

". . . . a larger percentage of athletes received degrees than non-athletes.

". . . . both groups carried approximately the same number of hours of study."⁵

Although the scholarship differences in Savage's completed survey were slight it is accepted that participation in athletics is not detrimental to the student. Participation is, in fact, desirable because of further benefits derived by the students as was shown by Hindman.

"..... the results of this study furnish strong support for a belief in the power of athletics in Ohio State University to hold students in school and thereby increase likelihood of being graduated."⁶

5. Fowlkes, J. D. "Athletes Have High Scholastic Standing at Rutgers." Nations Schools, 3:70 (Jan. 1929).
6. Hindman, op. cit.

Problem

To determine whether or not participation in the extra-curricular athletic program for women, as set up by the Department of Physical Education for Women at the University of Arizona, has any appreciable effect upon the scholarship of the women participating.

Primarily this study is concerned with the answers to these questions:

1. Does participation in this program have any effect upon scholarship?
2. If there is an effect is it favorable or unfavorable?
3. Does the effect appear with one semester of participation?
4. Does the effect appear more noticeably with two semesters of participation?

This study concerns four hundred twenty-five freshman women at the University of Arizona during the years 1933-1934, 1934-1935 and 1935-1936. In order to understand this study an explanation of the extra-curricular athletic program for women at the University of Arizona must be made.

Recent surveys made of women's athletics show that at present very few colleges use the intercollegiate type of program. This nearly obsolete practice has been replaced with the newer one of intramural athletics as used on the University of Arizona campus. The intramural type of pro-

gram is used almost exclusively in all schools having women's athletics and has gained the approval of all educational leaders in the realm of physical education. The outstanding advantage of using this type of a program for women is that it offers the opportunity of participation to every woman on the campus whereas in a true intercollegiate program only the few women who excel in the particular activities derive the pleasure and benefits of participation. Judging from the increase in numbers of participants in the intramural program over the old intercollegiate program at the University of Arizona, as well as at countless other schools, we should readily realize the importance of such a program and believe as Champlin:

"Athletic dexterity is in part a knack and gift of nature to be respected and conserved with the same reverence as musical and poetic genius. Any effort to minimize the educational and cultural importance of this worthy endowment should be severely assailed by professional leaders.

"We cannot expect all high school graduates to be scientific, literary or philosophical, and so something must be offered those who come with potential athletic supremacy as their stock in trade."⁷

The intramural program as used on the campus of the University of Arizona features purely amateur competition between the various house, dormitory and independent groups. It also discourages the practice of publicizing star per-

7. Champlin, Carrol D. "Educating the Athlete." School and Society, 29:151-152 (Feb. 15, 1929).

formers and placing emphasis on winning. While all women in the various sports put forth their best efforts to excel, the main objective behind all intramural competition is "play for play's sake."

Another outstanding advantage in intramural competition is the time element. The old intercollegiate program demanded hours of drill and practice which were both strenuous and fatiguing for the few participants. The travelling from school to school made large demands upon the participant's time and energy. The intramural program as now used eliminates all travelling off the campus. It also requires less practice and game hours. Therefore less time and energy are now spent on women's athletics. This saving of time and energy is a large factor in the effect of participation upon scholastic achievement because the time and energy previously spent on athletics can now be spent on required academic preparation.

With these underlying principles ever in mind the practice and game periods are conducted with one thought--recreation for the individual and for the group. A wholesome, enjoyable type of recreation such as this extra-curricular program for women at the University of Arizona offers, if properly conducted, should not prove detrimental to the scholastic achievements of the individual participants.

This study was made for two reasons: first, because there has been no study or survey made of the effect of participation in the extra-curricular athletic program for women at the University of Arizona; second, because there have been no, or very few, studies made on the effect of women's participation in athletics at other colleges or universities.

Limitations of This Study

The four hundred and twenty-five women used in this study were freshmen women during the years 1933-34, 1934-35, and 1935-36 found in the active files of the Registrar of the University of Arizona in June 1936.

These women were studied only during their first year at the University of Arizona. Had it been possible in this study to follow the interests, activities and scholastic achievement of each woman during her four years of university life the permanent effect of participation upon the individual could perhaps have been established. However, as the study has been conceived, only the scholastic effect of participation during the freshman year was determined.

One of the reasons for limiting the study to the freshman year of the four hundred twenty-five women was to secure as controlled a group of subjects as possible. During the first year of university work we find all freshman women taking practically the same basic courses. After the first year specialization begins in the field of major work for

each student. Thus, in making this study of the scholastic effect of participation in the extra-curricular athletic program of women, it was felt that the best time for studying this problem was during the freshman year when similar work was taken by the entire group of women students.

From the available data there was no way of determining the range of extra-curricular activities participated in by each student. It is very possible that women considered as "non-participants" in the extra-curricular athletic program were participants in other extra-curricular activities such as drama or debate, etc. It is also possible that the participants in the athletic program were also participants in other programs.

Such subjective factors as whether participation was spontaneous on the part of the individual or forced because of campus social groups requiring pledges to participate would be impossible to determine objectively. However, the spontaneity could be subjectively judged by the number of women who continue their participation after their sorority participation requirements have been fulfilled.

Another factor which would be a limitation to any study of this type is the question of freshman orientation. Authorities disagree on whether students should make better grades the first semester of their freshman year than the second semester. Does the change from high school work to

university work lower or raise grades? Does the change from the home life to dormitory or sorority life affect the student's scholastic work? Is it possible to become thoroughly orientated to university conditions before the second semester? These and many other similar questions are being asked and until they are definitely proved they will continue to be limitations to a study of this type.

CHAPTER II

METHODS OF WORK

Definitions as Used in This Study

(1) Extra-curricular Program of the Women's Physical Education Department: This program is the activity program of the Women's Athletic Association which is sponsored by the Department of Physical Education for Women. The program includes practices, games, tournaments and productions in the following activities: swimming, hockey, basketball, baseball, minor sports, tennis, golf, archery, dancing, riding and bowling. Each activity is guided by a student sport leader. This sport leader is in turn advised by a member of the Physical Education Staff who is also the coach of the sport. All practices, games, tournaments and productions are conducted after the regular school hours and no woman is excused from a regular class to participate. Activities are carried on from four-thirty until six o'clock with the exception of some dancing, basketball and bowling after dinner and tennis on Saturday mornings.

(2) Participant: A freshman woman who attended at least six after school practices and participated in all the games her team played in one sport or participated in a Women's Athletic Association production such as a dance

recital.

(3) Non-participant: A freshman woman who did not participate at all in the extra-curricular athletic program as set up by the Women's Physical Education Department.

(4) Average Grade Average: Term is used to denote the common grade average of the scholastic grades of an entire group of students.

Quartiles

The lower quartile or Q_1 is that point below which are 25% of the grade averages of the entire group studied.

Q_2 or the median is that point below which are 50% of the grade averages and above which are 50% of the grade averages of the entire group studied.

The upper quartile or Q_3 is that point which has 75% of the grade averages below it and 25% above it.

Percentiles

10th Percentile: Score or grade average below which 10% and above which 90% of the students in the group fall.

20th Percentile: Score or grade average below which 20% and above which 80% of the students in the group fall.

30th Percentile: Score or grade average below which 30% and above which 70% of the students in the group fall.

Subjects Used in This Study

Four hundred twenty-five women who were first and second

semester freshmen of the years 1933-1934, 1934-1935, 1935-1936 whose scholastic records were found in the active files of the Registrar of the University of Arizona in June 1936.

The distribution record of the four hundred twenty-five women was:

Women who did not participate either semester . .	190
Women who participated both semesters	139
Women who participated first semester and who became non-participants second semester . . .	41
Women who were non-participants first semester and who became participants second semester .	25
Women who participated first semester and who were not registered in school second semester	9
Women who did not participate first semester and who were not registered in school second semester	<u>21</u>
Total	425

Determining Participants

The Women's Athletic Association (referred to as "W. A. A.") at the University of Arizona offers an extra-curricular program composed of the following activities: swimming, hockey, basketball, baseball, minor sports, tennis, golf, archery, riding, dancing and bowling. The major sport program is divided into four seasons which are: swimming, hockey, basketball and baseball. The other activities are continuous throughout the year.

One of the incentives to participate in the extra-curricular athletic program which has not been mentioned is the accumulation of W. A. A. points which, totalling to

certain numbers, entitle the individual to various awards. For instance, one hundred W. A. A. points entitle a woman to become a member of the W. A. A., eight hundred points entitle her to a "varsity sweater" and sixteen hundred points entitle her to an initialled blanket in the school colors.

Any woman who is a student at the University of Arizona has the privilege of participating in this extra-curricular program and of earning W. A. A. activity points. W. A. A. activity points are awarded each student who has participated in at least six after school practices in one sport during its season. Additional points are awarded for participation in games of this activity program.

Twenty-five activity points are given for a minimum of six after school practices. A minimum of twenty-five additional points are given for competing in all of the games of one sport.

There is a definite minimum number of required practices but it is usually found that women completing the six necessary practices continue to report for practices during the entire season.

The number of hours spent on game participation varies from season to season and activity to activity. For instance, in swimming only two meets are held during the season but in basketball each girl plays approximately eleven games.

To determine which students were to be considered as participants in this study the W. A. A. activity points made by each freshman woman at the University of Arizona during the years 1933-1934, 1934-1935, 1935-1936 were studied as recorded in the point files of the W. A. A. Each freshman woman earning at least fifty points (which indicates one season's participation) was considered a participant.

Determining Non-Participants

Any freshman woman of 1933-1934, 1934-1935, 1935-1936 who did not earn any W. A. A. activity points was considered a non-participant.

Determining Grade Averages

Grades were taken from the active files of the Registrar at the University of Arizona. Academic grades at the University of Arizona are 1, 2, 3, 4 and 5 (failing grade). In computing the grade average the grade given by the instructor was multiplied by the number of hours or units of the course.

Example:	Grade	Units
Course-		
110a	2	3 = 6

These totals were added and then divided by the sum total of units to secure the grade average.

Example:	Grade	Units		
Course				
118a	2	3	=	6
124a	3	1	=	3
198a	1	4	=	4
178a	2	<u>5</u>	=	<u>10</u>
		13		23

$$23 \div 13 = 1.77 \text{ (grade average)}$$

In this way the grade average for each student was computed and recorded for the individual either as a participant or non-participant depending upon the individual's classification.

Incomplete Grades

All incomplete grades were disregarded unless a grade had since been given.

CHAPTER III

FINDINGS OF THIS STUDY

This study was made to determine whether or not participation has any appreciable effect upon the scholarship of the women who participate in the extra-curricular athletic program as set up by the Department of Physical Education for Women at the University of Arizona.

To determine whether or not there was an effect of participation on scholarship and if such an effect was favorable or unfavorable the first problem was set up.

Comparison of Scholarship of Participants and Non-Participants During the First and the Second Semester

The first phase of problem one compares the first semester grade averages made by one hundred eighty-nine freshman women of the years 1933-1934, 1934-1935 and 1935-1936 who were participants during the first semester with the first semester grade averages of two hundred thirty-six freshman women of the same years who were non-participants during the first semester. This comparison is shown in Table I.

TABLE I

GRADE AVERAGES OF PARTICIPANTS AND NON-PARTICIPANTS
IN THE WOMEN'S EXTRA-CURRICULAR ATHLETIC PRO-
GRAM DURING THE FIRST SEMESTER OF 1933-
1934, 1934-1935 AND 1935-1936
(Records of freshman women only)

Grade Average	PARTICIPANTS				NON-PARTICIPANTS			
	:1933- :1934	:1934- :1935	:1935- :1936	:Total	:1933- :1934	:1934- :1935	:1935- :1936	:Total
1.-1.49	: 4	: 3	: 3	: 10	: 2	: 1	: 3	: 6
1.5-1.99	: 3	: 5	: 6	: 14	: 3	: 2	: 7	: 12
2.0-2.49	: 10	: 13	: 19	: 42	: 11	: 14	: 23	: 48
2.5-2.99	: 7	: 16	: 24	: 47	: 9	: 9	: 26	: 44
3.0-3.49	: 9	: 14	: 19	: 42	: 11	: 17	: 30	: 58
3.5-3.99	: 3	: 11	: 5	: 19	: 5	: 8	: 21	: 34
4.0-4.49	: 1	: 1	: 10	: 12	: 3	: 6	: 17	: 26
4.5-4.99	: -	: 1	: 2	: 3	: 1	: 1	: 1	: 3
5.0-	: -	: -	: -	: -	: -	: 2	: 3	: 5
Total	: 37	: 64	: 88	: 189	: 45	: 60	: 130	: 236
90th percentile				1.82				2.06
80th				2.16				2.31
75th		(Q3)		2.28				2.43
70th				2.39				2.52
60th				2.60				2.83
50th		(Mdn)		2.84				3.07
40th				3.00				3.27
30th				3.23				3.48
25th		(Q1)		3.34				3.63
20th				3.46				3.81
10th				3.90				4.20

Table I shows the distribution of grades during the first semester of the years 1933-1934, 1934-1935 and 1935-1936 of both the participants and non-participants. The second part of Table I shows the percentile ranks of the participant group and of the non-participant group. The ranks show the grade average of each percentile of the participants to be better than the grade average of the corresponding non-participant percentile.

The median grade average of the participant group is 2.84 while the median grade average of the non-participant group is 3.07. The participant median grade average is .23 higher than the non-participant median grade average. To determine the reliability of this difference of the median grade averages the following formulas were used.

$$P.E. (mdn.) = \frac{5}{4} \frac{Q}{\sqrt{N}}$$

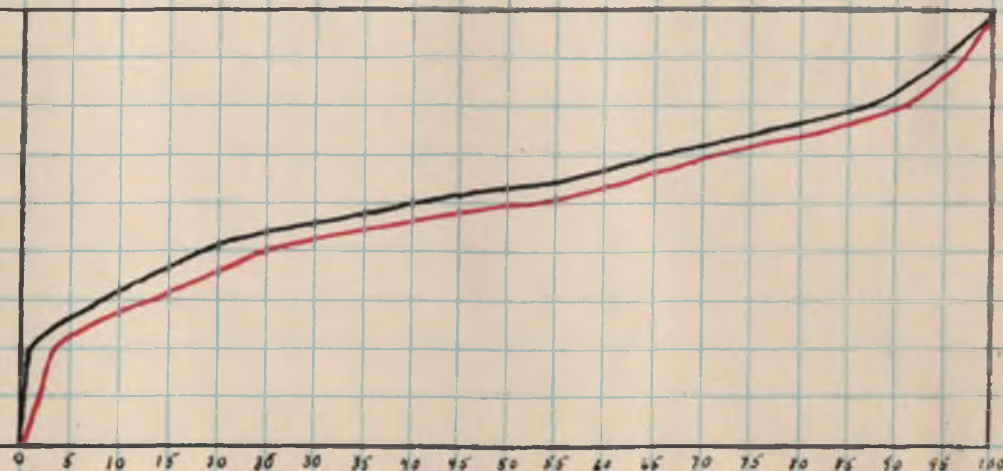
$$P.E. (diff.) = \sqrt{P.E. (mdn. 1)^2 + P.E. (mdn. 2)^2}$$

$$\frac{D}{P.E.} (diff.)$$

From these computations it was found that chances are eighty-seven out of one hundred that there is a difference greater than zero between the first semester median grade averages of the participants and the non-participants. This definitely proves that the first semester participants made higher grade averages than the first semester non-participants.

Percentile Graph 1 using the data found in Table I was made to graphically show the distribution of grades in the percentiles.

	P		N.P.	
Score	F.	F%	F.	F%
1.0-1.49	10	100	6	100
1.5-1.99	14	95	12	97
2.0-2.99	42	87	48	92
3.0-3.99	47	66	44	71
4.0-4.99	12	40	58	53
5.0-5.99	19	18	34	29
6.0-6.99	8	8	26	14
7.0-7.99	3	16	3	3
8.0-8.99	0	0	5	2.1
	189		336	



$$P = \frac{1}{189} = .0053 \text{ or } .53\%$$

— Participants

$$N.P. = \frac{1}{336} = .0042 \text{ or } .42\%$$

— Non-participants

Percentile Graph 1. Distribution of First Semester Grade Averages of Participants and Non-Participants. Freshman Women, University of Arizona, 1933-34, 1934-35, and 1935-36

Percentile Graph I shows the first semester grade averages of participants to be consistently higher than the first semester grade averages of the non-participants. Because the chances are eighty-seven out of a hundred that the median grade average of the participants is definitely higher than the median grade average of the non-participants it can be concluded that the entire distribution of first semester grades of participants is definitely higher than the entire distribution of first semester grades of the non-participants.

The second semester grade averages of participants and non-participants were studied in the same manner as were the first semester grade averages to complete the solution to the question, "Does participation have any effect upon scholarship?"

The second semester grade average distribution of the years 1933-1934, 1934-1935 and 1935-1936 are shown in Table II.

TABLE II

GRADE AVERAGES OF PARTICIPANTS AND NON-PARTICIPANTS
IN THE WOMEN'S EXTRA-CURRICULAR ATHLETIC PRO-
GRAM DURING THE SECOND SEMESTER OF 1933-
1934, 1934-1935 AND 1935-1936
(Records of freshman women only)

Grade Average	PARTICIPANTS				NON-PARTICIPANTS			
	1933- 1934	1934- 1935	1935- 1936	Total	1933- 1934	1934- 1935	1935- 1936	Total
1. -1.49	2	1	1	4	2	1	6	9
1.5-1.99	1	7	5	13	3	6	5	14
2.0-2.49	6	13	17	36	13	14	17	44
2.5-2.99	10	12	24	46	11	15	34	60
3.0-3.49	7	13	16	36	11	17	29	57
3.5-3.99	4	7	10	21	4	6	11	21
4.0-4.49	3	1	2	6	3	7	3	13
4.5-4.99	-	1	2	3	1	-	5	6
5.0-	-	-	-	-	-	2	5	7
Total	33	55	77	165	48	68	115	231
90th percentile	1.98				2.0			
80th	2.22				2.27			
75th	(Q ₃) 2.34				2.4			
70th	2.45				2.69			
60th	2.64				2.71			
50th	(Mdn) 2.82				2.91			
40th	3.0				3.1			
30th	3.23				3.31			
25th	(Q ₁) 3.35				3.41			
20th	3.46				3.52			
10th	3.82				4.11			

Table II shows the distribution of grades during the second semester of the years 1933-1934, 1934-1935, and 1935-1936 of both the participants and the non-participants. The second part of Table II shows the percentile ranks of the participant group and of the non-participant group. The ranks show the grade average of each percentile of the participants to be better than the grade average of the corresponding non-participant percentile.

The median grade average of the participant groups is 2.82 while the median grade average of the non-participant group is 2.91. The participant median grade average is .09 higher than the non-participant median grade average. To determine the reliability of this difference of the median grade averages the same formulas were used as were used in determining the reliability of the difference in the median grade averages of the first semester. From these computations it was found that chances are sixty-eight out of a hundred that there is a difference greater than zero between the second semester median grade averages of the participants and the non-participants. This proves that participants made a higher median grade average during the second semester than the non-participants.

Percentile Graph 2 using the data found in Table II was made to graphically show the distribution of grades in the percentiles.

	P.		N.P.	
Score	F.	F%	F.	F%
1.0-1.49	4	100	9	100
1.5-1.99	13	97	14	95.
2.0-2.49	36	89	44	89.
2.5-2.99	46	67	60	71.
3.0-3.49	36	40	57	45.
3.5-3.99	21	18	21	20.
4.0-4.49	6	5.	13	11.
4.5-4.99	3	1.8	6	6.
5.0-	0	0	7	3.

165

231

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

$$P: \frac{1}{165} = .0060 \text{ or } .60\%$$

$$N.P. \frac{1}{231} = .0043 \text{ or } .43\%$$

— Participants

— Non-participants

Percentile Graph 2. Distribution of Second Semester Grade Averages of Participants and Non-Participants. Freshman Women, 1933-1934, 1934-1935, 1935-1936

Percentile Graph 2 shows the second semester grade averages of participants to be consistently higher than the second semester grade averages of the non-participants. Because the chances are sixty-eight out of a hundred that the median grade average of the participants is higher than the median grade average of the non-participants it can be concluded that the entire distribution of second semester grades of participants is higher than the entire distribution of second semester grades of the non-participants.

The first problem dealing with the grade averages of participants and non-participants for the first and second semester shows that participants consistently had higher grade averages in the percentile groups than the non-participants. This result would indicate that participation did have an effect upon scholarship and that this effect was favorable.

Comparison of Scholarship of Women Who Were Participants One Semester and Non-Participants the Other

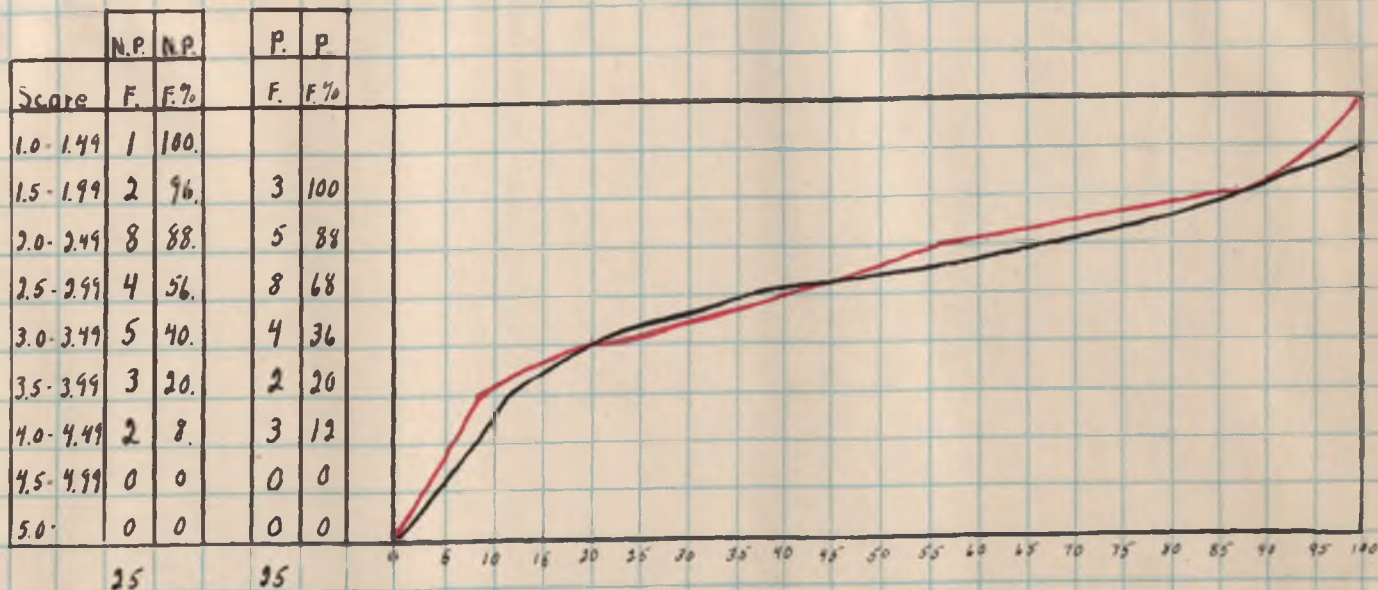
The first phase of problem two compares the first semester grade averages made by twenty-five women during first semester non-participation with the second semester grade averages made by the same women who became participants during the second semester. This comparison is shown in Table III.

TABLE III

GRADE AVERAGES OF FRESHMAN WOMEN WHO WERE NON-PARTICIPANTS
IN THE WOMEN'S EXTRA-CURRICULAR ATHLETIC PROGRAM THE
FIRST SEMESTER AND WHO BECAME PARTICIPANTS
DURING THE SECOND SEMESTER
(1933-1934, 1934-1935 and 1935-1936)

Grade Average	First Semester NON-PARTICIPATION					Second Semester PARTICIPATION				
	1933-1934	1934-1935	1935-1936	Total		1933-1934	1934-1935	1935-1936	Total	
	1934	1935	1936	Total		1934	1935	1936	Total	
1. -1.49	-	-	1	1		-	-	-	-	
1.5-1.99	-	2	-	2		1	1	1	3	
2.0-2.49	1	2	5	8		-	3	2	5	
2.5-2.99	1	1	2	4		-	1	7	8	
3.0-3.49	1	-	4	5		1	-	3	4	
3.5-3.99	1	-	2	3		1	1	-	2	
4.0-4.49	-	1	1	2		1	-	2	3	
4.5-4.99	-	-	-	-		-	-	-	-	
5.0-	-	-	-	-		-	-	-	-	
Total	4	6	15	25		4	6	15	25	
90th percentile				1.88					1.92	
80th				2.13					2.20	
75th		(Q ₃)		2.2					2.32	
70th				2.28					2.45	
60th				2.44					2.63	
50th		(Mdn)		2.67					2.78	
40th				3.0					2.99	
30th				3.23					3.20	
25th		(Q ₁)		3.37					3.34	
20th				3.50					3.5	
10th				3.58					4.08	

Table III shows the distribution of grades during the first semester of the years 1933-1934, 1934-1935 and 1935-1936 of twenty-five women who were non-participants and the second semester grade averages of the same women during second semester participation. The second part of Table III shows the percentile ranks of the twenty-five women during both semesters. Looking at the percentile ranks we see that in some instances the first semester non-participation grade averages are higher while in others the second semester participation grade averages are higher. To get a better picture of this distribution Percentile Graph 3 was made.



Percentile Graph 3. Distribution of First Semester Non-Participation Grade Averages and Second Semester Participation Grade Averages. Freshman Women, 1933-1934, 1934-1935, 1935-1936

Percentile Graph 3 graphically shows the second semester participation grade averages above the median to be lower than the first semester non-participation grade averages. In fact the non-participation grades of these twenty-five women are better in all the percentiles but the 40th, 30th and 25th.

The median grade average of the first semester non-participation is 2.67 while the median grade average of the second semester participation is 2.78. Thus the median grade average of first semester non-participation is .11 higher than the median grade average of second semester participation. To determine the reliability of this difference the same formulas were used as were used in problem one. From these computations it was found that chances are fifty-three out of one hundred that the first semester median non-participation grade average is actually higher than the median second semester grade average.

The second phase of problem two compares the first semester grade averages made by forty-one women during first semester participation with the second semester grade averages made by the same women during second semester non-participation. This comparison is shown in Table IV.

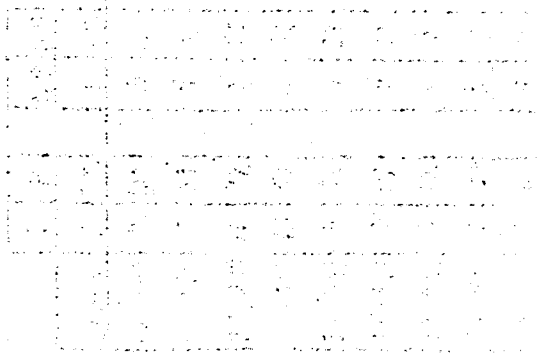
TABLE IV

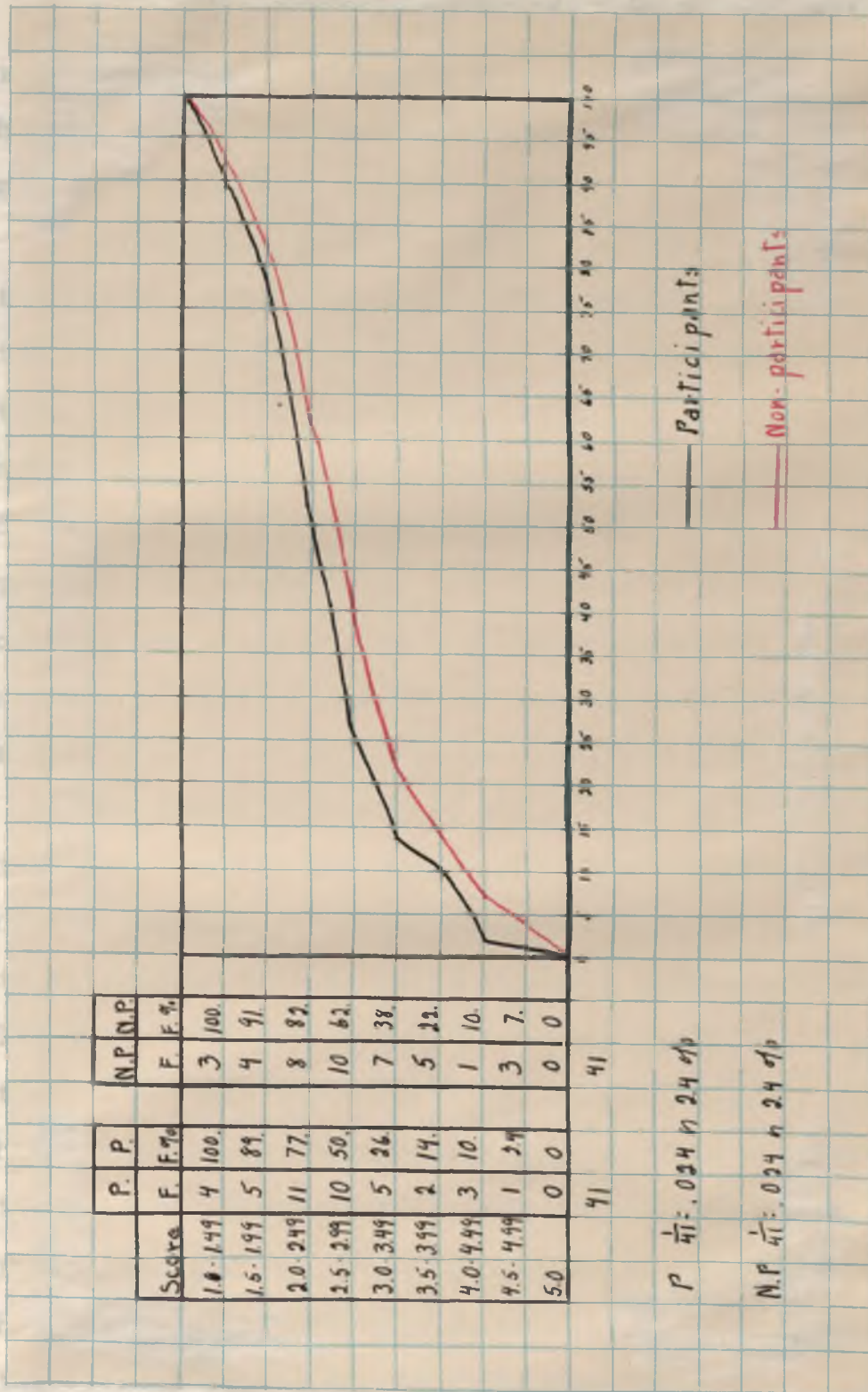
GRADE AVERAGES OF FRESHMAN WOMEN WHO WERE PARTICIPANTS IN
THE WOMEN'S EXTRA-CURRICULAR PROGRAM DURING THE FIRST
SEMESTER AND WHO BECAME NON-PARTICIPANTS
DURING THE SECOND SEMESTER
(1933-1934, 1934-1935 and 1935-1936)

Grade Average	First Semester PARTICIPATION				Second Semester NON-PARTICIPATION			
	1933- 1934	1934- 1935	1935- 1936	Total	1933- 1934	1934- 1935	1935- 1936	Total
1. -1.49	2	-	2	4	1	-	2	3
1.5-1.99	1	1	3	5	1	2	1	4
2.0-2.49	3	6	2	11	2	3	3	8
2.5-2.99	1	3	6	10	3	3	4	10
3.0-3.49	1	-	4	5	1	1	5	7
3.5-3.99	1	1	-	2	1	2	2	5
4.0-4.49	-	1	2	3	-	1	-	1
4.5-4.99	-	-	1	1	-	-	3	3
5.0-	-	-	-	-	-	-	-	-
Total	9	12	20	41	9	12	20	41
90th percentile				1.51				1.64
80th "				1.58				2.08
75th " (Q ₃)				2.06				2.20
70th "				2.17				2.33
60th "				2.53				2.57
50th " (Mdn)				2.55				2.75
40th "				2.73				2.98
30th "				2.99				3.27
25th " (Q ₁)				3.08				3.41
20th "				3.22				3.58
10th "				3.98				3.99

Table IV shows the distribution of grades during first semester participation and second semester non-participation of forty-one women who were freshman students during the years 1933-1934, 1934-1935, 1935-1936. The second part of Table IV shows the percentile ranks of the forty-one women during both semesters. The ranks show that the grade averages made during first semester participation are higher in each percentile than the grade averages made during second semester non-participation.

Using the data found in Table IV Percentile Graph 4 was made to graphically show the distribution of grades in the percentiles.





Percentile Graph 4. Distribution of First Semester Participation Grade Averages and Second Semester Non-Participation Grade Averages. Freshman Women, 1933-1934, 1934-1935, 1935-1936.

Percentile Graph 4 graphically shows the grade averages made during first semester participation to be consistently higher than the grade averages made during second semester non-participation.

The median grade average of the first semester participation is 2.55 while the median grade of second semester non-participation is 2.75. The first semester participation median grade average is .20 higher than the second semester non-participation median. The reliability of this difference was determined by using the formulas used in problem one. From these computations it was found that chances are sixty out of one hundred that the median grade average of first semester participation is higher than the median grade average of second semester non-participation.

The second problem has dealt with the effect of participation during one semester of participation. The results of this problem indicate that the effect of participation is noticeable even in one semester's participation. Problem two showed that women who participated the first semester and did not participate the second semester consistently had higher grade averages during the first semester participation. However, the women who did not participate the first semester and became participants the second semester had better grade averages in most of the percentiles during the first semester of non-participation.

CHAPTER IV

CONCLUSIONS

1. Participation does have an effect upon scholarship.
2. The effect of participation upon scholarship as shown in this study appears to be favorable.
3. The effect of participation appears with one semester of participation but it is neither as definite nor as consistent as with two semesters.
4. The effect of participation appears definitely and consistently with two semesters of participation.
5. The results of this study would seem to indicate that participation in an extra-curricular athletic program has a favorable effect on scholarship and definitely does not lower grade averages.

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