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Comparative study of visual care in Forest Grove and McMinnville high schools

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Comparative study of visual care in Forest Grove and McMinnville high schools

Abstract

Comparative study of visual care in Forest Grove and McMinnville high schools

Degree Type

Thesis

Degree Name

Master of Science in Vision Science

Committee Chair

Charles B. Margach

Subject Categories

Optometry

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COMPARATIVE STUDY OF VISUAL CARE IN FOREST GROVE
AND MCMINNVILLE HIGH SCHOOLS

PRESENTED TO THE FACULTY OF PACIFIC UNIVERSITY COLLEGE
OF OPTOMETRY IN PARTIAL FULFILLMENT OF THE DEGREE OF
DOCTOR OF OPTOMETRY

BY
STANLEY C. ADAMS
ROBERT B. CHARBONNEAU

MAY 1957

ACKNOWLEDGEMENTS

We hereby express our appreciation for the cooperation of Mr. Dawson of McMinnville High School and Mr. Gamble of Forest Grove Union High School for securing the information essential for this study.

In addition we express our appreciation to the students and teachers of Forest Grove and McMinnville High Schools who participated in securing the raw data for our study.

We are also indebted to Dr. Paul Eskildsen and to Dr. Charles B. Margach, both members of the faculty of Pacific University College of Optometry, who served as our statistical advisor and senior advisor respectively on this project.

INTRODUCTION

I. The Problem

The purpose of this study was to compare the visual care received by the high school populations of two communities, Forest Grove and McMinnville, which are similar in population, industry, and hinterland. They are both college towns separated by a distance of twenty-five miles. The difference we have attempted to study for significance is that Forest Grove offers, in addition to one private practitioner, the services of an optometric clinic whereas McMinnville offers the services of only private practitioners. There has been considerable speculation by many that the level of visual care in the Forest Grove area can be considered to have approached the saturation point as a result of the optometric clinic.

II. The Areas of the Problem Studied

The problem was approached by attempting to compare:

1. The number of persons who had received either optometric or medical visual care and its recency.
2. The number of persons who had received visual training and whether this was medical or optometric.
3. The number of persons prescribed an Rx and whether this was a full time Rx or a part time one.

4. The number in Forest Grove who availed themselves of the services of the Pacific University Optometric Clinic.

III. The Null Hypothesis

In order to permit conventional statistical analysis of the data it was assumed that there would be no significant difference at the 5% level of confidence with respect to the above areas.

PROCEDURE IN SECURING THE DATA

Included on the next page is a copy of the questionnaire which was presented to the high school students of each community. The accompanying explanation sheet was in the possession of each teacher who explained each question before it was answered.

In Forest Grove the questionnaire was answered in the home room. This resulted in all questionnaires being answered on the same day, giving us a return of 84.5%. In McMinnville the questionnaire was answered in the health class over a period of one week. Although this is a required subject for all students it yielded a return of only 60.5%.

It is our opinion, in conducting this survey, that we should have attempted to distribute the questionnaire in as similar a manner as possible in order to secure as nearly equal returns percentage wise from both communities.

It will be noticed on examination of the questionnaire sheet that in addition to those questions asked concerning the individual's visual care, four additional questions were asked. These were asked in an attempt to define our group as to class, age, and social status.

VISUAL CARE QUESTIONNAIRE

1. Age:			
<hr/>			
2. Class:			
<hr/>			
3. Father's occupation:			
<hr/>			
4. Mother's occupation:			
<hr/>			
5. Have you ever had a visual examination?		Yes	No
<hr/>			
6. When was last visual examination?	1 year	Yes	No
	<hr/>		
	2 years	Yes	No
	<hr/>		
	3 years	Yes	No
<hr/>			
	4 years	Yes	No
<hr/>			
	More	Yes	No
<hr/>			
7. Was last visual examination medical?		Yes	No
<hr/>			
8. Was last visual examination optometric?		Yes	No
<hr/>			
9. Are your glasses to be worn all the time?		Yes	No
<hr/>			
10. Are your glasses for near work only?		Yes	No
<hr/>			
11. Have you ever had visual training?		Yes	No
<hr/>			
12. Was the visual training optometric?		Yes	No
<hr/>			
13. Was the visual training medical?		Yes	No
<hr/>			
14. Was your visual care from the Pacific University Optometric Clinic?		Yes	No
<hr/>			

THE PURPOSE OF THIS QUESTIONNAIRE IS TO GATHER DATA WHICH WILL BE USED AS A COMPARATIVE STUDY OF THE VISUAL CARE AFFORDED BY PACIFIC UNIVERSITY'S OPTOMETRIC CLINIC IN FOREST GROVE AND THE VISUAL CARE AFFORDED BY PRIVATE PRACTITIONERS IN A COMPARABLE COMMUNITY.

EXPLANATION SHEET FOR QUESTIONNAIRE ON VISUAL CARE

1. Age: (Pupil's age on last birthday in years.)
2. Class: (Class in high school - freshman, sophomore etc.)
3. Father's occupation: (If employed, give occupation. If unemployed, disabled etc., please state.)
4. Mother's occupation: (If she does not work away from home, list as housewife. If she works out, give occupation.)
5. Have you ever had a visual examination? (This refers to a professional examination of vision by a doctor - not a screening test or an acuity check at a school.)
6. When was last visual examination? (This refers to a professional examination of vision by a doctor - not a screening test or an acuity check at school.)
7. Was last visual examination medical? (Was it performed by a member of the medical profession: general practitioner, ophthalmologist, eye, ear, nose and throat specialist.)
8. Was last visual examination optometric? (Was it performed by an optometrist (a specialist in vision) who practices without the use of drugs and drops.)
9. Are your glasses to be worn all the time? (Was pupil instructed by doctor to wear glasses at all times.)
10. Are your glasses for near work only? (Was pupil instructed to wear glasses only when doing close work such as desk work, reading, sewing, etc.)
11. Have you ever had visual training? (Visual training (orthoptics) is the use of eye exercises to alleviate discomfort and correct visual disturbances.)
12. Was the visual training optometric? (Was it performed by an optometric doctor or by an assistant under his supervision?)
13. Was the visual training medical? (Was it performed by a medical doctor or by an assistant under his supervision.)
14. Was your visual care from the Pacific University Optometric Clinic? (Visual care includes both visual training and the prescribing of glasses. The clinic referred to is operated by the Optometry School at Pacific University in Forest Grove.)

CLASS	NO.	AGE	YEARS					MED. OPT.	FULL TIME	NEAR ONLY	NO Rx.	V.T.	MED OPT	P.U.
			1	2	3	4	MORE							
FRESH. WITH EXAM.	124	14.3	75	15	16	6	12	19 105	40	23	60	37	2 35	65
FRESH. WITHOUT EXAM.	45	14.35	-	-	-	-	-	- -	-	-	-	-	- -	-
SOPH. WITH EXAM.	105	15.35	59	13	15	8	10	14 91	49	9	48	24	1 23	52
SOPH. WITHOUT EXAM.	47	15.42	-	-	-	-	-	- -	-	-	-	-	- -	-
JUNIOR WITH EXAM.	74	16.30	38	13	8	5	10	8 66	29	20	25	17	0 17	26
JUNIOR WITHOUT EXAM.	41	16.22	-	-	-	-	-	- -	-	-	-	-	- -	-
SENIOR WITH EXAM.	85	17.30	46	17	7	5	10	18 67	29	12	44	17	0 17	32
SENIOR WITHOUT EXAM.	29	17.38	-	-	-	-	-	- -	-	-	-	-	- -	-
TOTALS	550	-	218	58	46	24	42	59 329	147	64	177	95	3 92	175

CLASS	NO.	AGE	YEARS					MED. OPT.	FULL TIME	NEAR ONLY	NO Rx	V.T.	MED. OPT.	P.U.
			1	2	3	4	MORE							
FRESH. WITH EXAM.	99	14.4	66	13	8	4	8	29 70	36	18	45	14	1 13	4
FRESH. WITHOUT EXAM.	32	14.4	-	-	-	-	-	- -	-	-	-	-	- -	-
SOPH. WITH EXAM.	93	15.42	60	11	7	7	8	25 68	36	22	35	13	2 11	3
SOPH. WITHOUT EXAM.	27	15.41	-	-	-	-	-	- -	-	-	-	-	- -	-
JUNIOR WITH EXAM.	30	16.5	13	5	4	1	7	10 20	11	4	15	3	0 3	0
JUNIOR WITHOUT EXAM.	7	16.0	-	-	-	-	-	- -	-	-	-	-	- -	-
SENIOR WITH EXAM.	28	17.25	18	2	4	1	3	7 21	12	4	12	3	0 3	0
SENIOR WITHOUT EXAM.	10	17.20	-	-	-	-	-	- -	-	-	-	-	- -	-
TOTALS	326	-	157	31	23	13	26	71 179	95	48	107	33	3 30	7

FINDINGS

Question #1 Age

We found the mode to be at the 15 year age group both for Forest Grove and McMinnville, while the median age for Forest Grove was 16.023 and for McMinnville 15.646 years. Although no attempt has been made to test this for significance it will be noticed that there is essentially no difference between the two groups as far as age is concerned.

It will be noticed on the next page that the lower age of the McMinnville students was probably due to the fact that the majority of the returns were from the freshman and sophomore classes.

TABLE # 3

QUESTION #1 AGE

13 14 15 16 17 18 19

SENIOR WITH EXAM.	-	-	-	1	60	21	3
SENIOR WITHOUT EXAM.	-	-	-	1	18	9	1
JUNIOR WITH EXAM.	-	-	1	53	18	2	-
JUNIOR WITHOUT EXAM.	-	-	4	25	11	1	-
SOPH. WITH EXAM.	-	1	69	33	2	-	-
SOPH. WITHOUT EXAM.	-	-	29	16	2	-	-
FRESH. WITH EXAM.	-	87	36	1	-	-	-
FRESH. WITHOUT EXAM.	-	29	16	-	-	-	-

FOREST GROVE

13 14 15 16 17 18 19

SENIOR WITH EXAM.	-	-	-	-	21	7	-
SENIOR WITHOUT EXAM.	-	-	-	1	6	3	-
JUNIOR WITH EXAM.	-	-	1	16	10	3	-
JUNIOR WITHOUT EXAM.	-	-	-	7	-	-	-
SOPH. WITH EXAM.	-	-	62	24	6	1	-
SOPH. WITHOUT EXAM.	-	1	17	7	1	1	-
FRESH. WITH EXAM.	1	65	27	6	-	-	-
FRESH. WITHOUT EXAM.	1	20	9	2	-	-	-

MCMINNVILLE

Question #2

What is your class in school?

This question was included in order to group our data for each class. These classes were divided into lower division (freshman and sophomore) and upper division (juniors and seniors). These two divisions were separated on the basis of either having had or not having had a previous visual examination. The reader here is referred to question #5 of the data sheet.

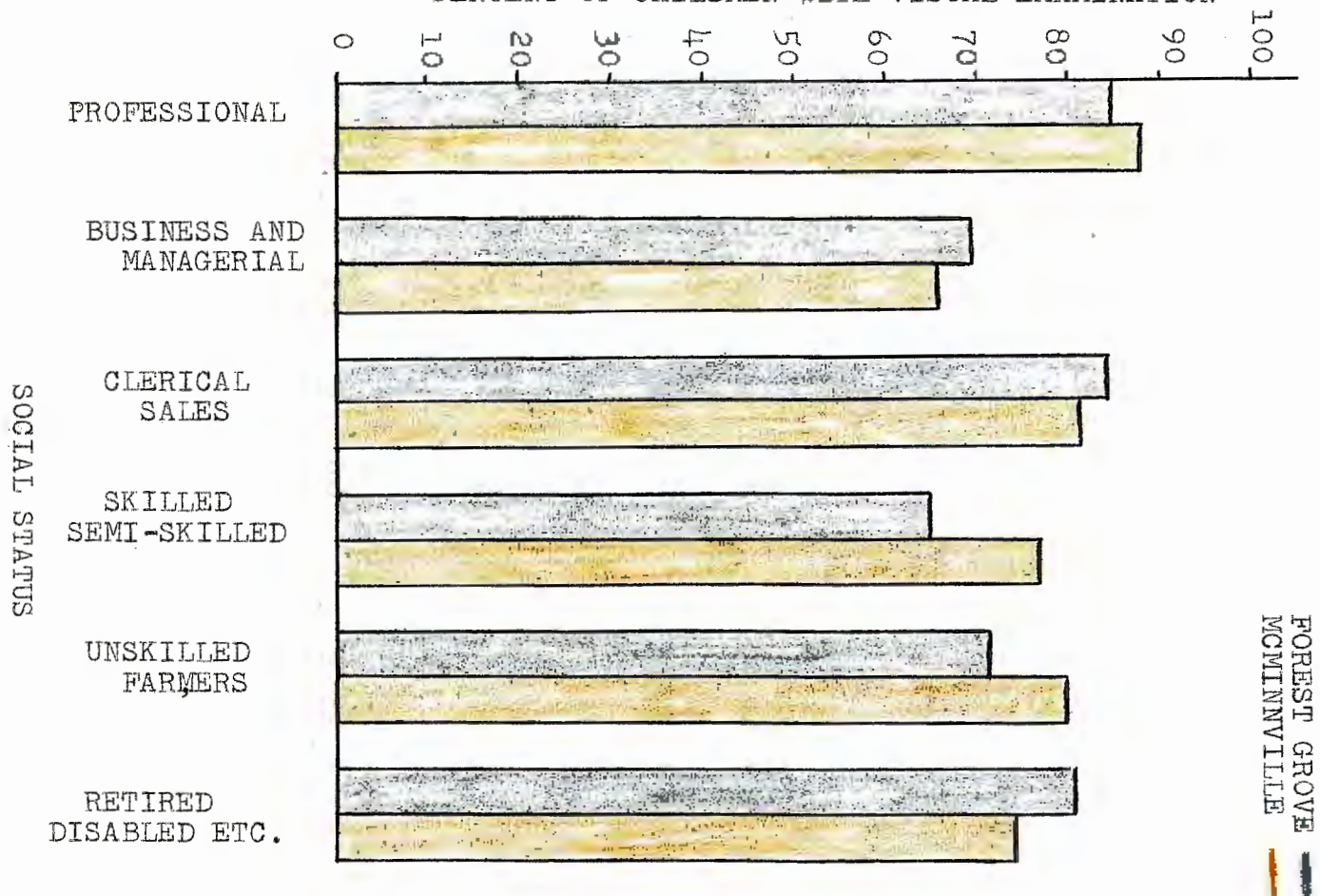
Questions #3 and #4

3. What is your father's occupation?

4. What is your mother's occupation?

This question was asked to make it possible to determine if position in society was a determining factor as far as visual care is concerned. Graph #1 shows the six divisions into which our population was grouped. This breakdown of occupations was suggested by John Berry, Professor of Sociology at Pacific University. He stated that this was a standard breakdown of occupations used in compiling sociological data. The respective percentages of children with visual examinations for each of these six groups, and for both communities, is clearly shown in the graph also. No attempt was made to analyse this data for significance difference.

PERCENT OF CHILDREN WITH VISUAL EXAMINATION



GRAPH #1

Question #5 Have you ever had a visual examination?

This question was considered to be the basic question of our study.

In these two groups we found a critical ratio of 2.0 which means that this difference would occur by chance only 3.5 times in 100. Since this is less frequent than our initially established 5% level of confidence we reject the null hypothesis. Thus McMinnville with its private practitioners had a significantly greater percentage of individuals receiving visual examinations than Forest Grove with its optometric clinic.

We also combined questions #7 and #8 with #5. We then determined the proportions served exclusively by optometrists in these two areas. Our critical ratio was below 1.96, indicating this difference would occur more than 5 times in 100.

In referring back to Question #2 to determine if there was a significant difference between upper and lower divisions having visual examinations, we found a critical ratio below 1.96 for both communities. This indicates that for either community the number with visual examinations in both the lower and upper groups was not significantly different.

Question #6 When was last visual examination?

This question was asked of those who had a visual examination in an attempt to determine its recency. We have divided these into two groups, those who have had a visual examination within the past two years, and those who have had a visual examination more than two years ago. We assume those with adequate visual care to be those that fall into the former group.

In comparing the two communities we found the critical ratio to be 1.15 causing us to accept the null hypothesis that there was not a significant difference as to the recency of visual examinations.

Questions #7 and #8

#7. Was last visual examination medical?

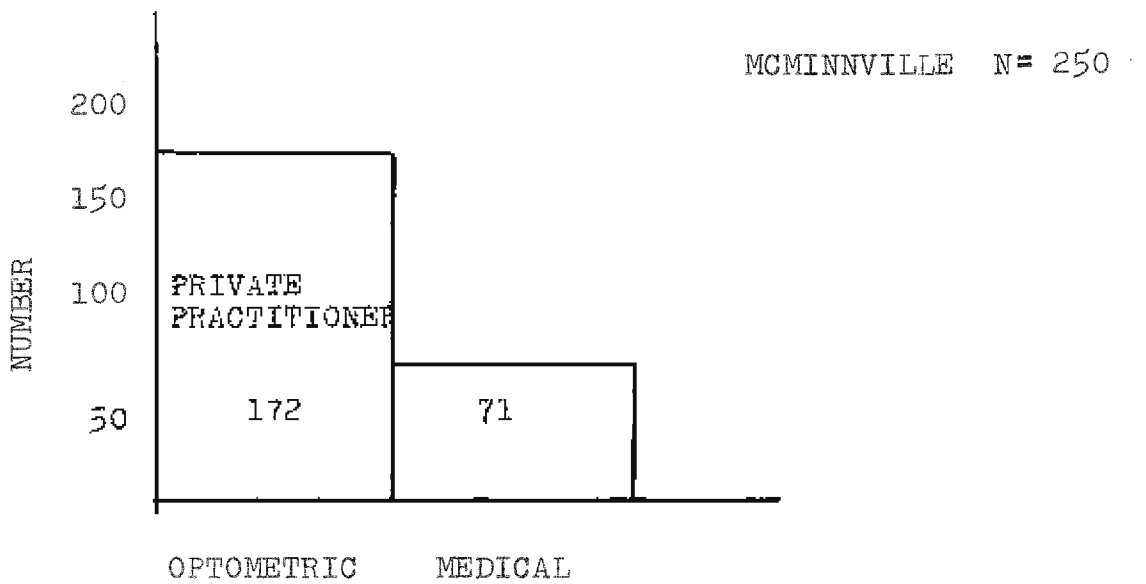
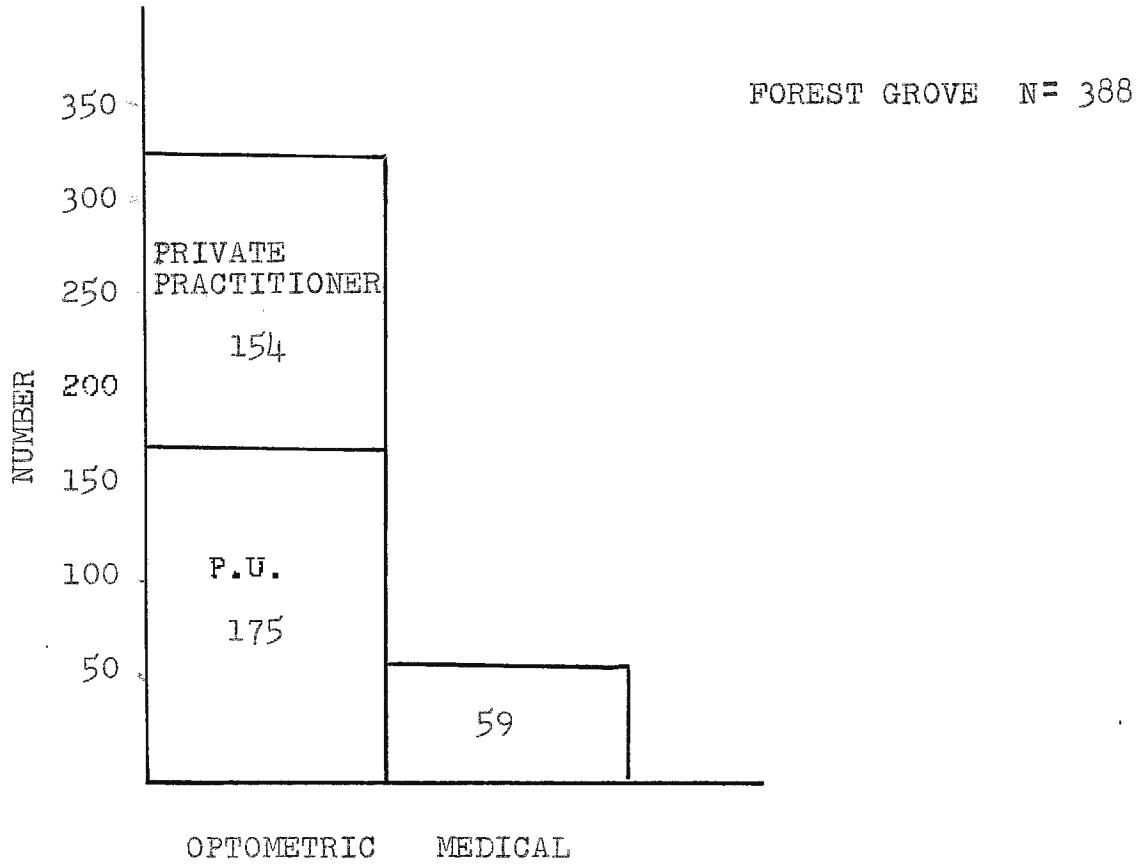
#8. Was last visual examination optometric?

Those of question #5 who have had a visual examination were separated into groups by questions seven and eight. We then determined if there was a significant difference between those who received optometric visual care and those who received medical visual care in both Forest Grove and McMinnville.

Of those individuals who had had visual examinations we found there was a greater number with optometric visual care in both communities, McMinnville 71.5% and Forest Grove 84.8%. On the other hand, when considering those with medical visual care, we found McMinnville to have a significantly greater number than Forest Grove. (C.R. = 3.85)

GRAPH #2

QUESTIONS # 7-8-14



Questions #9 and #10

9. Are your glasses to be worn all the time?
10. Are your glasses for near work only?

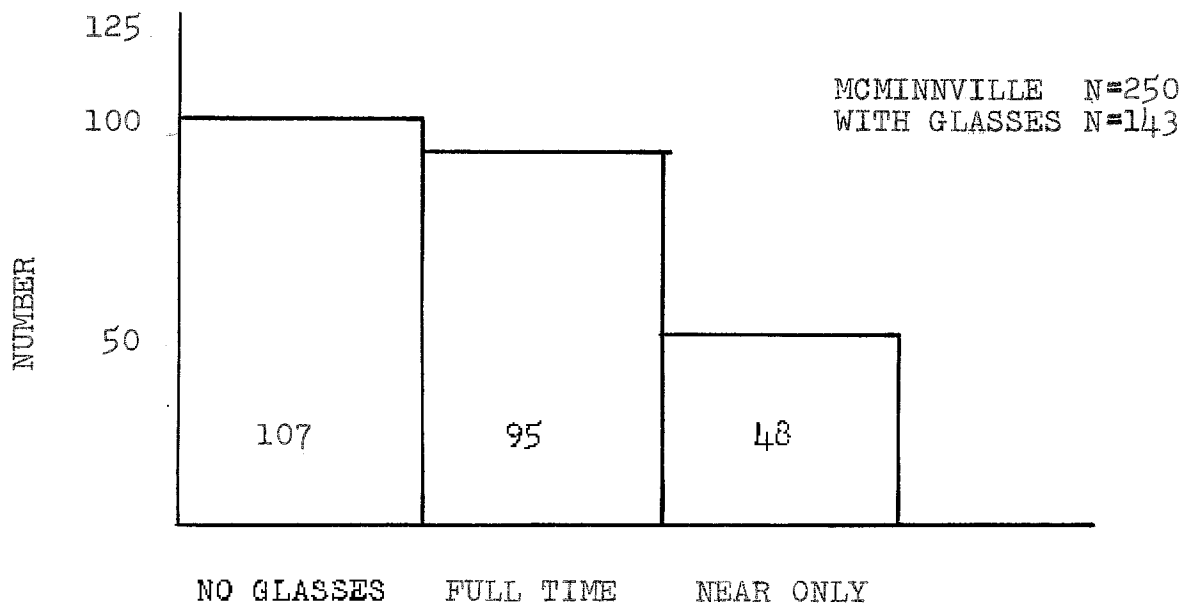
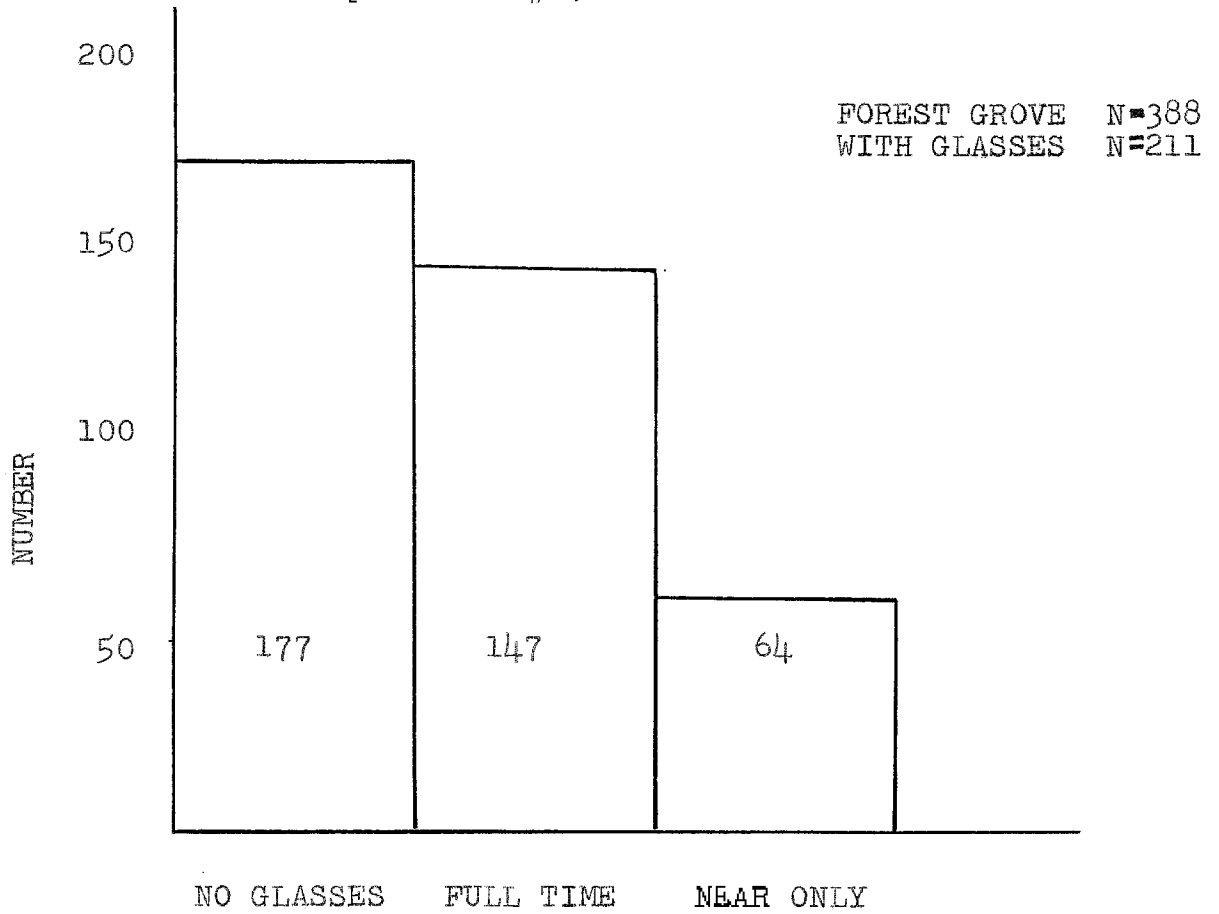
In reference to the above questions we now feel that a third question should have been asked, namely "Were glasses prescribed"? In lieu of this, we assumed (for those who reported having ever had a visual examination) that a negative answer on both numbers nine and ten or no answer at all on these two questions indicated that no glasses were prescribed.

Thus from these two questions we attempted to determine if there was a difference between those of each community who had been prescribed an Rx and those who had not. With a critical ratio of 0.7, we are accepting the null hypothesis that there was not a significant difference in the ratio between the number receiving visual care and the number wearing glasses in either community.

We also determined if there was a difference between the number of prescriptions for near work only between the two communities. For this the null hypothesis is again accepted.

See graph #3 for illustration.

GRAPH # 3
QUESTIONS # 9-10



Question #11 Have you ever had visual training?

In this question we have ascertained whether or not the individual has had visual training. With a critical ratio of 3.7 the null hypothesis was rejected, thus we concluded there was significantly more visual training therapy received in Forest Grove.

Questions #12 and #13

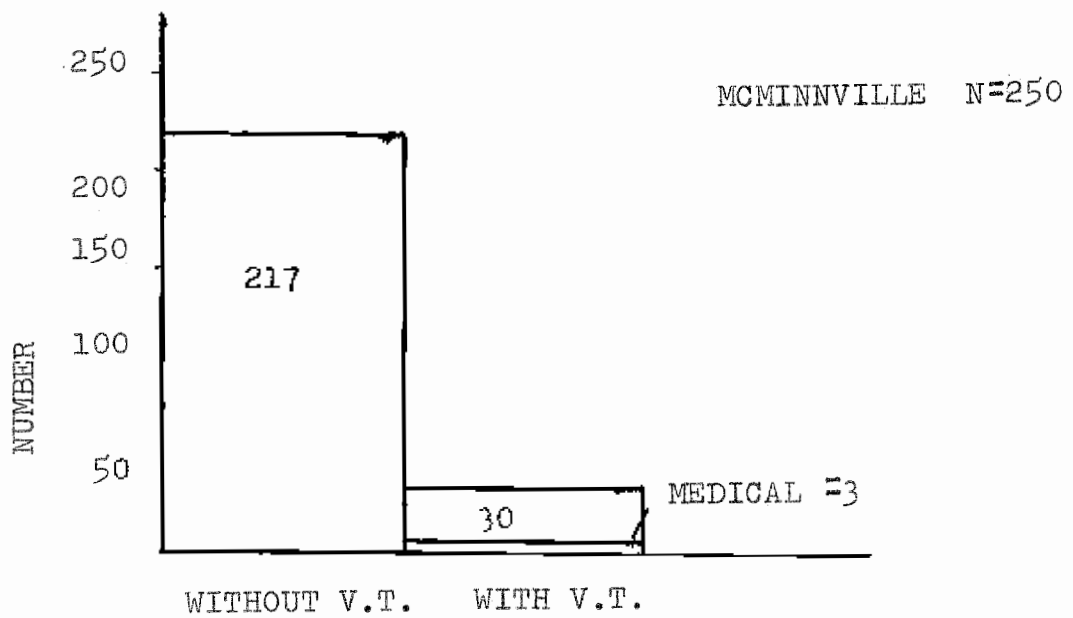
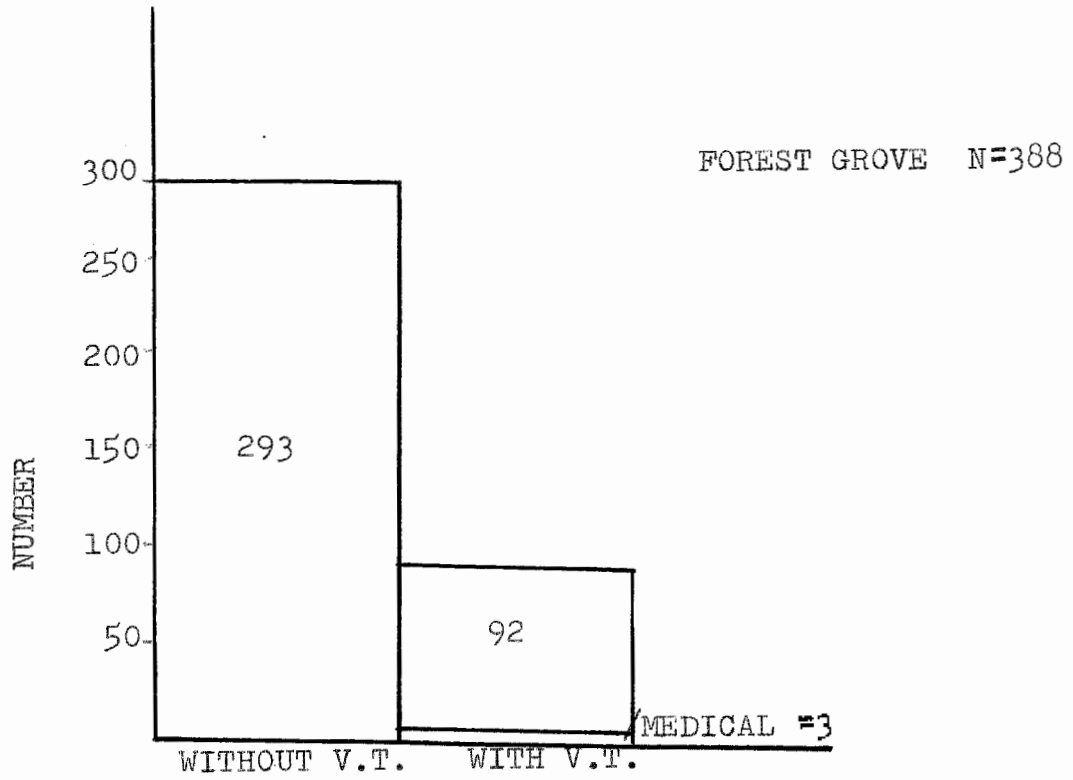
#12. Was the visual training optometric?

#13. Was the visual training medical?

An analysis of the data of these two questions shows us that there is significantly more visual training being performed by optometric practitioners than by medical practitioners in both communities.

See graph #4 for illustrative picture of above data.

GRAPH # 4
QUESTIONS # 11-12-13



Question # 14 Was your visual care from the Pacific
University Optometric Clinic?

Question #14 was included in this study to determine the percent of the high school population in Forest Grove receiving visual care from the Pacific University Optometric Clinic as compared with private practitioners. We found that of those who received optometric visual care, only 45% were served at the Pacific University Clinic.

CONCLUSIONS

Throughout this study we have maintained that these are comparable communities and on the basis of the null hypothesis we should not find a significant difference in any of the areas studied. This was true in most instances but in the following the null hypothesis was rejected.

1. McMinnville shows a significantly greater number with visual examinations.
2. Of those individuals who received medical visual care, McMinnville showed a significantly greater number than Forest Grove.
3. Forest Grove shows a significantly greater number with visual training.

In the following instances the null hypothesis was accepted.

1. The number having had visual examinations in both the lower and upper class divisions was not significantly different.
2. There was not a significant difference as to the recency of visual examinations.
3. There was significantly greater optometric visual care in both communities.
4. There was not a significant difference in the ratio between the number receiving visual care and the number wearing glasses in either community.

5. There was not a significant difference between the number of prescriptions for near work only in the two communities.

In addition to the above, we also found in our study that of the Forest Grove population less than one half (45%) sought the services of the Pacific University Clinic.

PROBLEMS FOR FURTHER STUDY

1. Many assume that Forest Grove represents a saturation point and would have a higher level of visual care than other communities. In this study we have investigated whether the clinic makes the difference in visual care and we have not studied what effect the college of optometry might have had. McMinnville is outside the reasonable sphere of the clinic, but not outside the sphere of prestige and influence of public relations and awareness of visual care. It may be beneficial in the future to compare Forest Grove with a community more distant and not under this sphere of influence but still a community of the same social and economic structure.
2. A more complete visual care questionnaire might have included a question regarding the prescription of bifocal lenses. This might have indicated to us whether certain optometric trends were developing in one community whereas they were not developing in another.
3. A further analysis of the occupational data might reveal pertinent information regarding the relationship of social and economic status to the visual care received.