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## A comparison of the clinical populations of the Oregon Optometric Center and the Pacific University Optometric Clinics

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### Recommended Citation

Diederich, P J.; Magliocco, M V.; and Robins, R W., "A comparison of the clinical populations of the Oregon Optometric Center and the Pacific University Optometric Clinics" (1971). *College of Optometry*. 323.  
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## **A comparison of the clinical populations of the Oregon Optometric Center and the Pacific University Optometric Clinics**

### **Abstract**

This is a study comparing the populations of two optometric clinics. The purpose of this study is to present a statistical comparison of the Oregon Optometric Center and the Pacific University Optometric Clinic. A questionnaire was completed by Junior and Senior Optometry. Students to record these differences. The results showed significant differences between the two populations as to the patient's last visual examination, last medical or dental examination, residence, education, entrance habitual visual acuity, presbyopic near prescripti on, and the near nonpresbyopic prescription. Recommendations are included for present use and further study.

### **Degree Type**

Thesis

### **Degree Name**

Master of Science in Vision Science

### **Committee Chair**

### **Subject Categories**

Optometry

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A COMPARISON OF THE CLINICAL POPULATIONS OF  
THE OREGON OPTOMETRIC CENTER AND THE  
PACIFIC UNIVERSITY OPTOMETRIC CLINICS

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College of Optometry  
Pacific University

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submitted in partial fulfillment  
of the requirements for the  
Doctor of Optometry Degree

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by


P. J. Diederich  
M. V. Magliocco  
R. W. Robins

May 1971

## ABSTRACT

This is a study comparing the populations of two optometric clinics. The purpose of this study is to present a statistical comparison of the Oregon Optometric Center and the Pacific University Optometric Clinic. A questionnaire was completed by Junior and Senior Optometry Students to record these differences. The results showed significant differences between the two populations as to the patient's last visual examination, last medical or dental examination, residence, education, entrance habitual visual acuity, presbyopic near prescription, and the near non-presbyopic prescription. Recommendations are included for present use and further study.

APPROVED

  
\_\_\_\_\_ Chairman

  
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### ACKNOWLEDGEMENTS

We would like to thank Dr. Richard Septon for his help and guidance in preparation of this paper. We would also like to give special thanks to Doctors Pratt, Jessen, Hunter, and Yamamoto for their suggestions and help.

P.J.D.  
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R.W.R.

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## INTRODUCTION

The lack of vital optometric statistics concerning various patient populations is appalling. Statistics pertaining to the visual needs of a certain segment of a population are vital in designing comprehensive health care programs, especially in hard core or urban areas. Knowledge of the characteristics of patient populations are equally necessary for delivering optimal visual care to the general public.

With these thoughts in mind, a study was devised to compare statistically various aspects of two clinical populations with each other and also to pinpoint the salient characteristics of the two populations individually. The two clinics selected were the College of Optometry outpatient clinic in Forest Grove, Oregon and the Oregon Optometric Center located in downtown Portland, Oregon.

Differences between these two optometric populations were expected for several reasons. First of all, the geographical locations of these two clinics are radically different. Patients should therefore be drawn from different socio-economic strata having different visual characteristics and incidences of deficiencies. Secondly, the patients at

the Oregon Optometric Center are generally referred for care by private and public or welfare agencies, while the patients at the Pacific University Optometric Clinic are self-referred. This suggests possible differences in the frequency and regularity of health care, with an attending difference in the need for care. It is postulated that for these and other reasons there should be demonstratable differences between the two clinical populations.

Knowledge of the statistical characteristics of patient populations can have many applications. These statistics can justify the need for federal and private grants to establish optometric clinics where visual care is most urgently needed. Then too, if it could be shown that there are specific problems within a patient population which are unusually prevalent, there is an opportunity to study these problems in depth. This could lead to an analysis of the environmental and hereditary influences on certain visual phenomena. For example, an analysis of the therapy provided in attempt to halt progressive myopia and other "optometric epidemics" can also be made to further optometry's knowledge in this area.

Our first task in undertaking this study was to determine which characteristics to compare. This led naturally to the devising of a data retrieval system and then,

finally, to a method for analyzing statistically this data. Several optometric clinics are proposing data collection systems and some are already in use. A. N. Haffner, O.D., Ph.D., Executive Director of the Optometric Center of New York stated, ". . . we at the center feel urgent need for development and implementation of a program which will make clinical data easily retrievable for research as well as for clinical use and are working toward this goal."<sup>1</sup> H. B. Peters, O.D., Dean of the School of Optometry at the University of Alabama has reported the proposal of a data retrieval system at his institution.<sup>2</sup> In reviewing the literature however, we found few studies which laid out the methodology and optometric statistics which should be used in a data retrieval system. W. R. Baldwin, O.D., Ph.D. reviewed the data retrieval system at the College of Optometry, Indiana University.<sup>3</sup> The purpose of the data retrieval system at Indiana is very similar to this present study at Pacific University, only the method of data collection and analysis is different. The need for research in this area is quite evident.

Our pilot study compared one hundred three patients from the Pacific University Optometric Clinic with one hundred six patients of the Oregon Optometric Center. The study was designed to provide information regarding which

optometric findings are significantly different between the two populations. It also investigated the incidence and relationships between specific visual problems within the two populations.

## EXPERIMENTAL METHOD

The data retrieval method devised for this clinical survey was a questionnaire which was designed so that the student clinician could easily complete it at the conclusion of his case study with minimum instruction. The questionnaire, shown in Appendix A, was included with each case record of 103 consecutive patients in the junior and senior clinics at Forest Grove, and for 106 consecutive patients in the senior clinic at the Oregon Optometric Center. All data was taken during the month of March, 1971.

Each student clinician was asked to blacken in the circle or circles which most appropriately described his findings and optometric diagnosis. Special instructions, shown in Appendix A, were attached to the forms to explain specific items requested which might not be self evident. However, the student clinician's cooperation was less than desired so the originators of this thesis project had to fill out approximately 75% of the forms themselves. The raw data from the questionnaires were then separated into tabular form by computer and by card sort. Chi square and contingency coefficients for each entry were then obtained from this computer data, thereby allowing for an item by item comparison of the two clinical populations.

## DISCUSSION AND RESULTS

The data were tabulated and analyzed by computer which yielded the following results:

- 1) Frequency Distributions and Percentages for all sub-categories that appeared on the questionnaire for both the Oregon Optometric Center and Pacific University Optometric Clinic. These results appear in Tables I and II.
- 2) Tables III and IV show the contingency coefficient comparisons of paired optometric findings at both the Oregon Optometric Center and Pacific University Optometric Clinic.
- 3)  $\chi^2$  comparisons of different optometric findings at the Oregon Optometric Center and the Pacific University Optometric Clinic appear in Tables V and VI, respectively.
- 4) Table VII reveals the  $\chi^2$  comparisons of the Oregon Optometric Center and Pacific University Optometric Clinic under the various clinical categories and sub-categories.

These tables point out the data which is statistically significant at the P.05 confidence level. A detailed discussion of the results from the categories and individual sub-categories follows these tables.

In each detailed discussion of the various sub-categories graphs are provided to represent the results in these areas. These results are also provided in Tables I, II, and VII for reference if necessary.



TABLE I: Frequency Distribution and Percentages of the Categories for the Oregon Optometric Center

CASE HISTORY

1. Last Visual Examination	6 mo. 18 (18%)	1 year 17 (17%)	2 yrs. 14 (14%)	3 yrs. 20 (20%)	4 yrs. 1 (1%)	5 yrs. 45 (44%)	
2. Most Recent Medical or Dental Examination	6 mo. 42 (42%)	1 year 44 (44%)	2 yrs. 11 (11%)	3 yrs. 0	4 yrs. 0	5 yrs. 5 (5%)	
3. Age of the Patient	1-6 yr. 2 (2%)	7-14 20 (19%)	15-24 44 (42%)	30-44 11 (11%)	45-60 15 (14%)	60+ 13 (12%)	
4. Patient's Residence	urban 82 (78%)	city 14 (13%)	suburb 1 (1%)	town 5 (5%)	rural 2 (2%)	other 1 (1%)	
5. Patient's Education	gr.sch. 30 (28%)	hi.sch. 29 (27%)	college 3 (3%)	voc. 14 (13%)	other 23 (22%)		
6. Visual History and Symptomology	blur @N 43 (43%)	blur @F 43 (42%)	Asth 28 (25%)	Task 31 (29%)	Dip 7 (7%)	Hdache 32 (30%)	Other 6 (6%)
7. Entrance Hab. Acuity (better eye)	20/20 58 (57%)	20/30 28 (28%)	20/40 5 (5%)	20/60 6 (6%)	20/80 2 (2%)	20/120 1 (1%)	20/200 2 (2%)

PATHOLOGY

1. Referrable Pathology	Ext. 4 (4%)	Corn. 1 (1%)	Iris 0	Lens 1 (1%)	Ret. 5 (5%)	Ref. 5 (5%)	
2. Amblyopia (V.A. in the Amblyopic Eye)	20/30 5 (5%)	20/40 1 (1%)	20/60 1 (1%)	20/80 0	20/120 1 (1%)	20/200 2 (2%)	

Table I (Continued)

HETEROPHORIA (non-presby.)

1. Heterophoria (no. 8) or tropia at far	Eso. 0	6+Eso. 5(5%)	5-1Eso. 31(29%)	0-4Exo. 59(56%)	5-9Exo. 5(5%)	10+Exo. 0	Exo. 0
2. Habitual Heterotropia (at near or far)	W/Amb 0	Exo F&N 1(1%)	Exo @ N 0	Rec. NPC 5(5%)	Exo @ N 2(2%)	Exo F&N 1(1%)	Para 0
3. Visual training and/or Binocular Therapy	Office 1(1%)	Dev.Tr. 1(1%)	Accom.Tr. 0	0-0-0 Tr 0	BI Prsm 4(4%)	BO Prsm 0	Vert P 1(1%)

PRESBYOPIA

1. Binocular therapy for presbyopes	Office 0	0-0-0 Tr 0	Vt Prsm 0	No Prsm 12(11%)	BI Prsm 0	BI Near 4(4%)	BI F&N 0
2. (14B Gross) - (Hab. Rx) @ Near	.25 5(5%)	.50 4(4%)	.75 0	1.00 1(1%)	1.50 4(4%)	1.75 0	2.00 12(11%)

NEAR PRESCRIPTION (non-pres)

1. (14B Gross) - (Hab. Rx) @ near	.25 12(11%)	.50 11(10%)	.75 8(8%)	1.00 15(14%)	1.50 15(14%)	1.75 5(5%)	2.00 13(12%)
2. (Prescribed TNP) - (Habitual TNP)	7(7%)	9(8%)	17(16%)	8(8%)	3(3%)	1(1%)	5(5%)

FAR PRESCRIPTION

1. ( <u>Myopic</u> Sph. Equiv. Prescribed) - (Hab. Sph. Equiv.)	.25 10(9%)	.50 7(7%)	.75 8(8%)	1.00 6(6%)	1.50 5(5%)	1.75 1(1%)	2.00 4(4%)
2. ( <u>Hyperopic</u> Sph. Equiv. Prescribed) - (Hab. Sph. Equiv.)	14(13%)	5(5%)	8(8%)	3(3%)	1(1%)	1(1%)	3(3%)
3. (Magnitude of Cylinder in Rx) - (Magnitude of Cylinder in Hab.)	16(15%)	19(18%)	12(11%)	6(6%)	2(2%)	1(1%)	3(3%)

TABLE II: Frequency Distribution and Percentages of Clinical Categories of the Pacific University College of Optometry

CASE HISTORY							
1. Last Visual Examination	6 mo. 18(18%)	1 year 25(25%)	2 yrs. 12(12%)	3 yrs. 16(16%)	4 yrs. 2(2%)	5 yrs. 25(25%)	
2. Most Recent Medical or Dental Examination	6 mo. 16(16%)	1 year 44(43%)	2 yrs. 10(10%)	3 yrs. 10(10%)	4 yrs. 1(1%)	5 yrs. 12(12%)	
3. Age of the Patient	1-6 yr. 5(5%)	7-14 25(24%)	15-24 32(31%)	30-44 8(8%)	45-60 21(20%)	60+ 11(11%)	
4. Patient's Residence	urban 9(9%)	city 20(20%)	suburb 9(9%)	town 37(37%)	rural 26(26%)	other 0	
5. Patient's Education	gr.sch. 26(25%)	hi.sch. 27(26%)	college 14(14%)	voc. 3(3%)	other 21(20%)		
6. Visual History and Symptomology	blur @N 29(29%)	blur @F 26(24%)	Asth 15(14%)	Task 21(20%)	Dip 4(4%)	Hdache 12(11%)	Other 10(10%)
7. Entrance Hab. Acuity (better eye)	20/20 81(80%)	20/30 17(17%)	20/40 0	20/60 3(3%)	20/80 1(1%)	2/120 0	20/200 0
PATHOLOGY							
1. Referrable Pathology	Ext. 2(2%)	Corn. 0	Iris 0	Lens 0	Ret. 1(1%)	Ref. 2(2%)	
2. Amblyopia (V.A. in the Amblyopic Eye)	20/30 0	20/40 1(1%)	20/60 0	20/80 0	20/120 0	20/200 1(1%)	

Table II (Continued)

HETEROPHORIA (non-presby.)

1. Heterophoria (no. 8) or tropia at far	Eso. 0	6+Eso. 4(4%)	5-1Eso. 31(30%)	0-4Exo. 58(56%)	5-9Exo. 4(4%)	10+Exo. 2(2%)	Exo. 0
2. Habitual Heterotropia (at near or far)	W/Amb 0	Exo F&N 2(2%)	Exo @ N 0	Rec. NPC 4(4%)	Exo @ N 5(5%)	Exo F&N 8(8%)	Para 0
3. Visual training and/or Binocular Therapy	Office 1(1%)	Dec.Tr. 0	Accom.Tr. 0	0-0-0 Tr 3(3%)	BI Prsm 0	BO Prsm 2(2%)	Vert P 3(3%)

PRESBYOPIA

1. Binocular therapy for presbyopes	Office 0	0-0-0 Tr 1(1%)	Vt Prsm 0	No Prsm 27(26%)	BI Prsm 0	BI Near 1(1%)	BI F&N 0
2. (14B Gross) - (Hab. Rx) @ Near	.25 10(10%)	.50 8(8%)	.75 4(4%)	1.00 5(5%)	1.50 4(4%)	1.75 1(1%)	2.00 3(3%)

NEAR PRESCRIPTION (non-pres)

1. (14B Gross) - (Hab. Rx @ near)	.25 13(13%)	.50 3(3%)	.75 8(8%)	1.00 12(12%)	1.50 14(14%)	1.75 0	2.00 4(4%)
2. (Prescribed TNP) - (Habitual TNP)	9(9%)	6(6%)	3(3%)	7(7%)	6(6%)	0	2(2%)

FAR PRESCRIPTION

1. ( <u>Myopic</u> Sph. Equiv. Prescribed) - (Hab. Sph. Equiv.)	.25 17(16%)	.50 6(6%)	.75 3(3%)	1.00 2(2%)	1.50 3(3%)	1.75 0	2.00 1(1%)
2. ( <u>Hyperopic</u> Sph. Equiv. Prescribed) - (Hab. Sph. Equiv.)	7(7%)	9(9%)	8(8%)	5(5%)	0	0	0
3. (Magnitude of Cylinder in Rx) - (Magnitude of Cylinder in Hab.)	22(21%)	13(13%)	3(3%)	2(2%)	1(1%)	0	1(1%)

TABLE III: Contingency Coefficients Comparing two Optometric Findings at the Pacific University College of Optometry

Comparison of two Optometric Findings	$\chi^2$	d.f.	Cont. Coef. "C"	$\chi^2_{(.05)}$	N
1-Last Visual Exam vs/ Symptomology	14.6127	30	.34243	43.77	110
2-Last Visual Exam vs/ Entrance Hab. visual acuity	3.5601	5	.19720	11.07	97
3-Last Visual Exam vs/ Age	32.7488	25	.50239	37.65	97
4-Symptomology vs/ (14B Gross-Near Rx)	31.0328	30	.60058	43.77	55
5-Symptomology vs/ Near Presbyopic Rx	34.9381	24	.74505	36.42	28
6-Symptomology vs/ $\Delta$ Far Myopic Sph. Equiv.	23.3645	24	.68110	36.42	27
7-Symptomology vs/ Hyperopic Rx	18.2315	18	.67317	28.87	22
8-Symptomology vs/ Far Cylindrical Magnitude	11.9167	15	.51507	25.00	33

NOTE: 
$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

$O_{ij}$  = the observed number of cases in  $i$ th row of the  $j$ th column

$E_{ij}$  = number of cases expected under  $H_0$  to be categorized in the  $i$ th row of the  $j$ th column

$\sum_{i=1}^r \sum_{j=1}^k$  - directs one to sum over all ( $r$ ) rows and all ( $k$ ) columns, or over all cells

TABLE IV: Contingency Coefficients Comparing two Optometric Findings at the Oregon Optometric Center

Comparison of two Optometric Findings	$X^2$	d.f.	Cont. Coef. "C"	$X^2(.05)$	N
1-Last Visual Exam vs/ Symptomology	16.0827	30	.28003	43.77	189
2-Last Visual Exam vs/ Entrance Hab. visual acuity	23.342	30	.43326	43.77	101
3-Last Visual Exam vs/ Age	21.2533	25	.44514	37.65	86
4-Symptomology vs/ (14B Gross-Hab. Near Rx)	28.4971	36	.53787	43.77+	70
5-Symptomology vs/ Near Presbyopic Rx	27.4513	36	.61544	43.77+	45
6-Symptomology vs/ Δ Far Myopic Rx	39.9869	36	.72068	43.77+	37
7-Symptomology vs/ Δ Far Hyperopic Rx	25.6177	36	.66108	43.77+	33
8-Symptomology vs/ Δ Far Cylinder Magnitude	29.9044	36	.59000	43.77+	56

NOTE: The contingency coefficient C is a measure of the extent of association between two sets of attributes, and may be treated or interpreted in the same manner as a correlation coefficient.

$$C = \sqrt{\frac{X^2}{N + X^2}}$$

$X^2$  = the chi-square between the two samples

N = total number of cases in both samples and all cells

TABLE V:  $\chi^2$  Comparisons of Different Optometric Findings  
at the Oregon Optometric Center

Comparison of two Optometric Findings by $\chi^2$	$\chi^2$	d.f.	$\chi^2$ $\chi(.05)$	Significance
1-Last Visual Exam vs/ Last Medical Exam	88.4059	5	11.07	Highly Signi- ficant (.001 level)
2-(14B Gr-Hab Rx) vs/ (TNP Rx-Hab near Rx)	15.3656	6	12.59	Significant
3-Far Myopic Rx vs/ Far Hyperopic Rx	4.36303	6	12.59	Not Significant
4- $\Delta$ Presbyopic Add Given vs/ $\Delta$ TNP Rx (non-pres)	23.4896	6	12.59	Highly Signi- ficant (.001 level)

TABLE VI:  $\chi^2$  Comparisons of Different Optometric Findings  
at the Pacific University Optometric Clinic

Comparisons of two Optometric Findings by $\chi^2$	$\chi^2$	d.f.	$\chi^2$ (.05)	Significance
1-Last Visual Exam vs/ Last Medical Exam	11.694	5	11.07	Significant
2-(14B Gr-Hab Rx) vs/ (TNP Rx-Hab near Rx)	4.36799	5	11.07	Not Significant
3-Far Myopic Rx vs/ Far Hyperopic Rx	12.2071	5	11.07	Significant
4- $\Delta$ Presbyopic Add Given vs/ $\Delta$ TNP Rx (non-pres)	2.35775	6	12.59	Not Significant



TABLE VII:  $\chi^2$  Comparisons of the Oregon Optometric Center and the Pacific University College of Optometry under the Various Clinical Categories

Category	$\chi^2$	degrees of freedom	$\chi^2(.05)$	Significance
CASE HISTORY				
1. Last Visual Examination	11.7885	5	11.07	Significant
2. Most Recent Medical or Dental Examination	25.2235	5	11.07	Highly Significant
3. Age of the Patient	5.334	5	11.07	Not Significant
4. Patient's Residence	111.936	4	9.49	Highly Significant
5. Patient's Education	14.3720	4	9.49	Significant
6. Visual History and Symptomology	6.69317	6	12.59	Not Significant
7. Entrance Habitual Acuity (better eye)	15.8280	6	12.59	Significant
PATHOLOGY				
1. Referrable Pathology	4.8213	4	9.49	Not Significant
2. Amblyopia (V.A. in the Amblyopic Eye)	3.600	4	9.49	Not Significant
HETEROPHORIA (Non-presbyopes)				
1. Heterophoria (no. 8) or tropia at far	2.2258	4	9.49	Not Significant
2. Habitual Heterotropia (at near or far)	4.12995	3	7.82	Not Significant
3. Visual training and/or Binocular Therapy	10.9206	5	11.07	Not Significant

Table VII (Continued)

Category	$\chi^2$	degrees of freedom	$\chi^2$ (.05)	Significance
PRESBYOPIA				
1. Binocular therapy for presbyopes	5.252	2	5.99	Not Significant
2. (14B Gross) - (Hab. Rx) @ near	15.0668	6	12.59	Significant
NEAR PRESCRIPTION (Non-pres.)				
1. (14B Gross) - (Hab Rx @ near)	10.4126	6	12.59	Not Significant
2. (Prescribed TNP) - (Habitual TNP)	10.9811	6	12.59	Not Significant
FAR PRESCRIPTION				
1. ( <u>Myopic</u> Sph. Equiv. Prescribed) - (Hab. Sph. Equiv.)	8.4838	6	12.59	Not Significant
2. ( <u>Hyperopic</u> Sph. Equiv. Prescribed) - Hab. Sph. Equiv.)	8.48829	6	12.59	Not Significant
3. (Magnitude of Cylinder in Rx) - (Magnitude of Cylinder in Hab.)	9.2051	6	12.59	Not Significant

Case History

1. Last Visual Examination

Figure 1 and Table I for the Oregon Optometric Center (OOC) show that 44% of the population have gone five years since their last visual examination. This is followed by 3 years (19%), 1 year (16%), 2 years (14%), 6 months (8%), and 4 years (1%).

Figure 1: Time since patient's last visual examination versus the number of patients

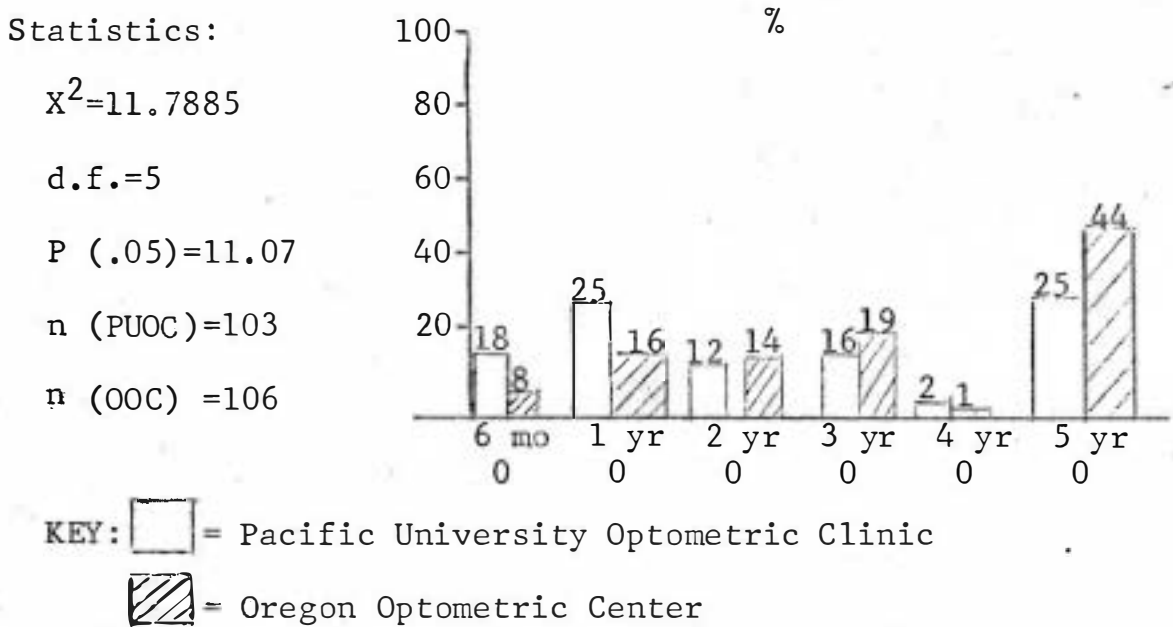


Figure 1 and Table II show the results from the Pacific University Optometric Clinic (PUOC). Here, again the majority of patients have gone 5 years (25%) since their last visual examination. This is followed by 6 months (18%), 3 years (16%), 2 years (12%), and 4 years (2%).

Table III shows the contingency coefficients when comparing last visual examination with symptomology, entrance habitual visual acuity and age of patient for the Pacific University Optometric Clinic. We did not expect to find a positive relationship between last visual examination and entrance habitual acuity, symptomology or age of patient. Surprisingly, though, we did find a positive contingency coefficient for each of these areas. The chi square value, however, for each area compared is not significant, therefore the contingency coefficient cannot be significant.

Table IV shows the contingency coefficient when comparing last visual examination with symptomology, entrance habitual visual acuity, and age of patient for the Oregon Optometric Center. Again, we did not expect a positive relationship between these three sub-categories. The contingency coefficients for each area compared is positive, but the chi square values are not significant, thus the contingency coefficient at the 0.05 level are not significant.

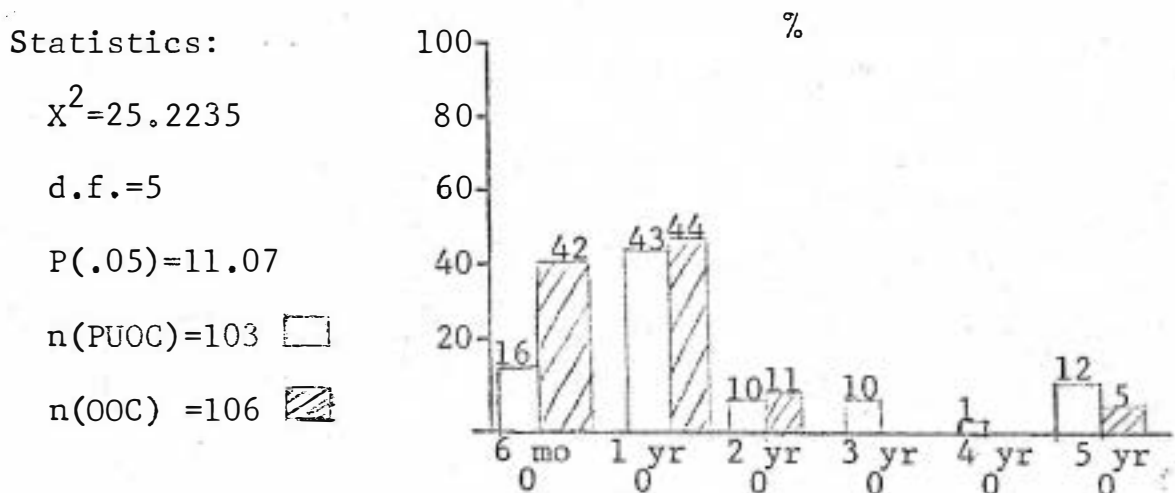
Table VI shows the chi square value comparing the last visual examination with the last medical examination for Pacific University Optometric Clinic patients. The chi square value shows a significant difference between these two categories, indicating that these patients receive medical care more frequently than visual care. Table V shows the

chi square value comparing the last visual examination with the last medical examination for Oregon Optometric Center patients. The chi square show a highly significant difference between these two categories indicating that the patients at the Oregon Optometric Center also receive more frequent medical care than visual care.

2. Most Recent Medical or Dental Examination

Figure 2 and Table I for the Oregon Optometric Center shows that 44% of the population have gone 1 year since their last medical or dental examination. This is followed by 6 months (42%), 2 years (11%), 5 years (5%), and 4 years (0%). Figure 2 and Table II also shows results from the Pacific University Optometric Clinic. 43% of the population have gone 1 year since their last medical or dental examination followed by 6 months (16%), 5 years (12%), 2 and 3 years (10% each), and 4 years (1%).

Figure 2: Time since the patient's most recent medical or dental examination versus the number of patients



These results show that there is a significant difference between the medical care received by the patients of the two clinical populations.

### 3. Age of Patient

Figure 3 and Table II for the Pacific University Optometric Clinic shows that 31% of the population are between the ages 15 and 29 years. This is followed by 7 to 14 years (24%), 45 to 60 years (20%), 60 years and up (11%), 30 to 34 years (8%), and 1 to 6 years (5%). The results from Figure 3 and Table I also shows the data from the Oregon Optometric Center. The results show that 42% of the population are between 15 and 29 years of age, followed by 7 to 14 years (19%), 45 to 60 years (14%), 60 years and up (12%), 30 to 44 years (11%), and 1 to 6 years (2%).

Figure 3: Age of patient versus number of patients

Statistics:

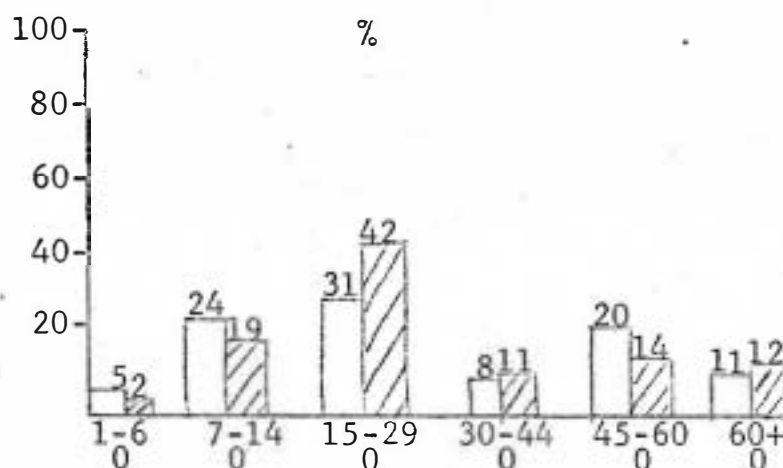
$$\chi^2 = 5.334$$

$$d.f. = 5$$

$$P (.05) = 11.07$$

$$n(\text{PUOC}) = 103$$

$$n(\text{OOC}) = 106$$



In summary, the results in this sub-category (Age of Patient) indicate that patients at the Pacific University Optometric Clinic are more evenly distributed in the various age categories, while the patients at the Oregon Optometric Clinic occur in the younger age categories, particularly in the 15 to 29 year age group.

#### 4. Patient's Residence

The data in Figure 4 and Table I show that 78% of the population at the Oregon Optometric Center are from an urban area. This is followed by city (13%), town (5%), rural (2%), suburb (1%) and other (1%). Figure 4 and Table II show results from the Pacific University Optometric Clinic. Here, 37% of the population are from towns followed by rural (26%), city (20%), and urban and suburb (9% each).

Figure 4: Patient's residence versus the number of patients

Statistics:

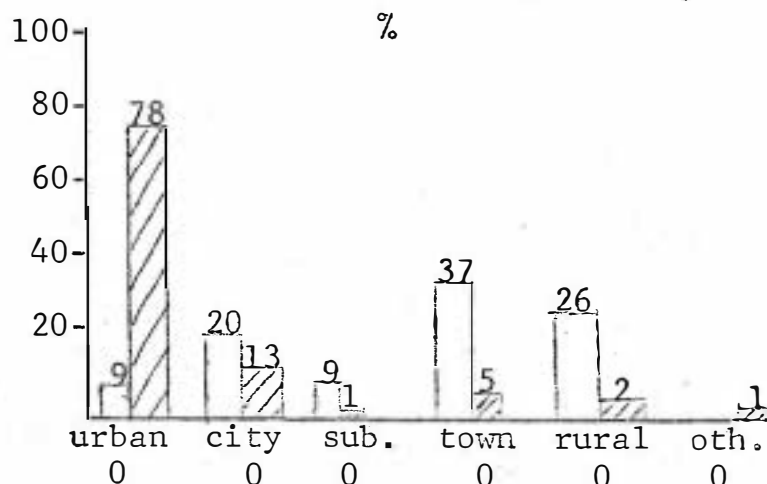
$$\chi^2=111.936$$

$$d.f.=4$$

$$P (.05)=9.49$$

$$n(\text{PUOC})=103$$

$$n(\text{OOC})=106$$



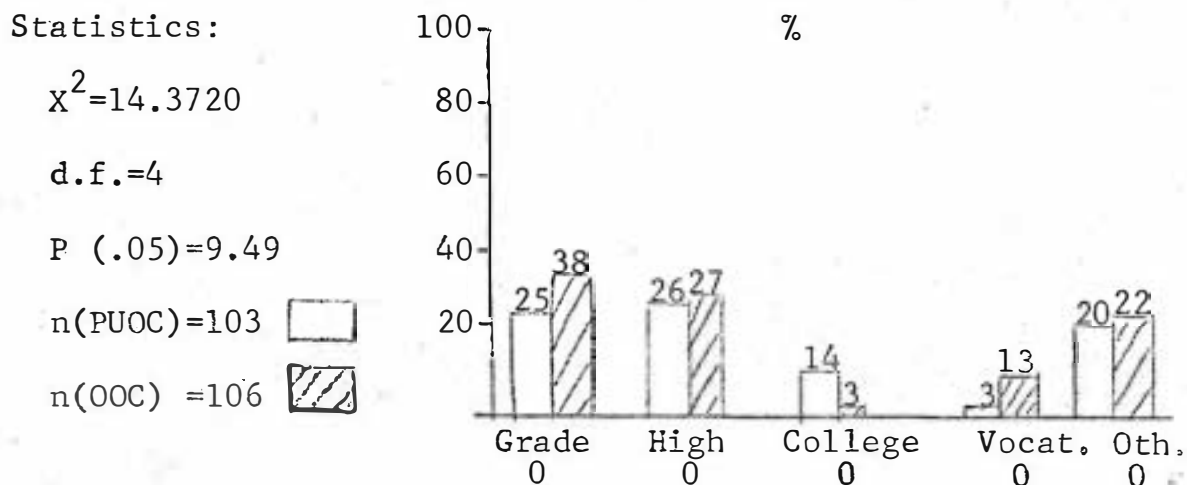
As would be expected, a greater number of patients from urban areas are seen at the Oregon Optometric Center, while there is a higher number of patients at Pacific University Optometric Clinic who live in towns and rural areas.

#### 5. Patient's Education

The data in Figure 5 and Table I for the Oregon Optometric Center shows the 38% of the population have reached only the grade school level. This is followed by high school (29%), other (22%), vocational (13%), and college (3%).

Figure 5 and Table II shows that a majority of the Pacific University Optometric Clinic patients have either grade school (25%), or a high school (26%) education, followed by other (20%), college (14%), and vocational (4%). It can be seen from Figure 5 that the majority of patients at both Oregon Optometric Center and Pacific University Optometric Clinic have either a grade school or high school education.

Figure 5: Patient's education versus the number of patients





## 6. Visual History and Symptomology

Figure 6 and Table I shows that the majority of patients at the Oregon Optometric Center complained of blur at near (42%), and blur at far (42%). This is followed by asthenopia (26%), task (29%), headache (30%), diplopia (7%), and other (6%). Figure 5 and Table II show the results from the Pacific University Optometric Clinic. The majority of patients complained of blur at near (27%), blur at far (24%), task (20%), asthenopia (14%), headache (11%), other (9%), and diplopia (4%). The results in Figure 6 show a higher incidence of symptomology in all categories for patients from the Oregon Optometric Center, although these results are not significant.

Figure 6: Visual History and Symptomology versus the number of patients

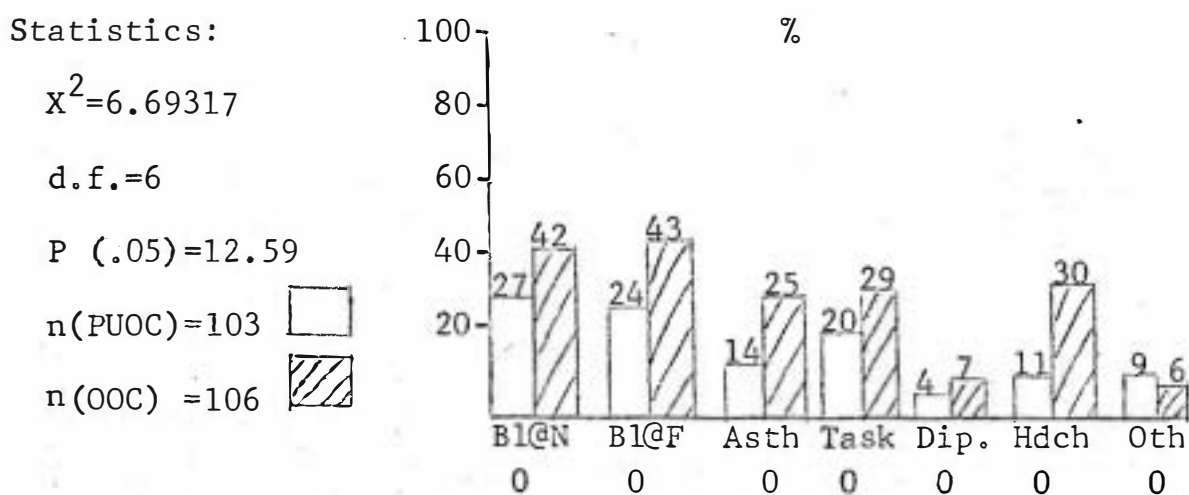


Table IV shows the contingency coefficients when comparing visual history and symptomology with the 14B Gross minus the near prescription, the near presbyopic prescription, the change in far myopic spherical equivalent, change in the far hyperopic spherical equivalent, and the change in the far cylindrical magnitude for the Oregon Optometric Center. The contingency coefficient for each area compared is positive. However, the chi square value for each area compared is not significant. Therefore the contingency coefficient at the .05 level is not significant. Table III shows the contingency coefficients when comparing visual history and symptomology with the 14B Gross minus the near prescription, the near presbyopic prescription, the change in far myopic spherical equivalent, change in the far hyperopic spherical equivalent, and the change in the far cylindrical magnitude for the Pacific University out patients. The contingency coefficient for each area compared is positive. However, the chi square value for each area compared is not significant. Thus the contingency coefficient at the .05 level cannot be significant.

In summary, contingency coefficient analysis indicates that visual symptomology has a positive relationship between the various prescription criteria although the relationships cannot be said to be significant. However,

we can say that the greatest relationships between symptomology and prescription criteria occurs in the following order:

1. Symptomology versus change in far myopic prescription (.72078 for the Oregon Optometric Center and .68110 for the Pacific University Optometric Clinic)
2. Symptomology versus change in far hyperopic prescription (.66108 for the Oregon Optometric Center and .67317 for the Pacific University Optometric Clinic)
3. Symptomology versus change in near presbyopic prescription (.61544 for the Oregon Optometric Center and .74505 for the Pacific University Optometric Clinic)
4. Symptomology versus change in far cylinder magnitude (.5900 for the Oregon Optometric Center and .51507 for the Pacific University Optometric Clinic)
5. Symptomology versus the change in 14B Gross minus habitual near prescription (.53787 for the Oregon Optometric Center and .60058 for Pacific University Optometric Clinic).

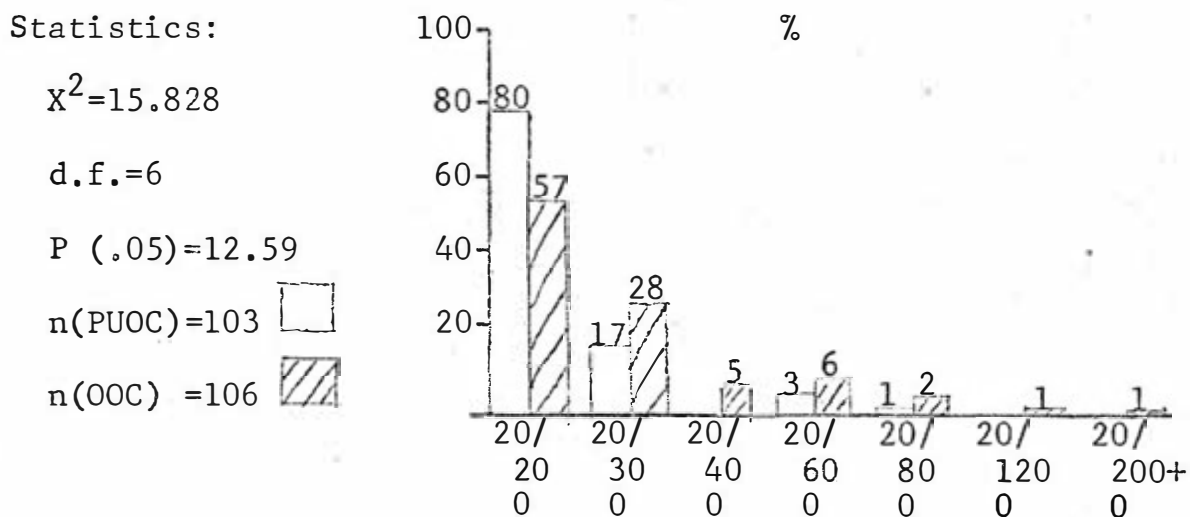
While the results in the prescription criteria were not significant, they do provide indications of patient symptomology.

#### 7. Entrance Habitual Acuity (better eye)

The data from Figure 7 and Table I shows that 57% of the population had an entrance habitual acuity of 20/20 at the Oregon Optometric Center. This is followed by 20/30 (28%), 20/60 (6%), 20/40 (5%), 20/80 (2%), 20/120 (1%) and

20/200 (1%). The results from Figure 7 and Table II also show that for the Pacific University Optometric Clinic the population had an entrance habitual acuity of 20/20 for 80%. This is followed by 20/30 (14%), 20/60 (3%), 20/80 (1%), and 20/40, 20/120, 20/200 (all 0%). These results show a much higher frequency of patients with 20/20 habitual entrance visual acuity in the Pacific University Optometric Clinic population. In general we can also say that the results indicate a much lower entrance habitual acuity at the Oregon Optometric Center than at the Pacific University Optometric Clinic.

Figure 7: Entrance Habitual Acuity versus number of patients

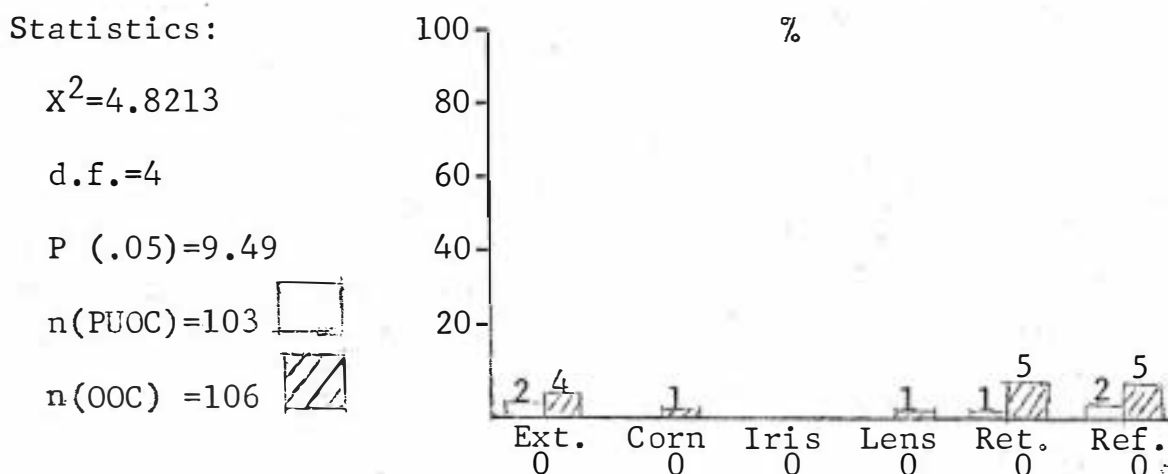


## Pathology

### 1. Referrable Pathology

The data from Figure 8 and Table I shows that retinal (5%) and refrerrable (5%) pathology are the most prevalent at the Oregon Optometric Center. This is followed by external (4%), corneal (1%), lens (1%) and iris (0%). The data from Figure 8 and Table II also shows the data from the Pacific University Optometric Clinic. The results show that refrerrable pathology makes up 2% of the population, retinal 1%, external 1%, iris and lens 0%. The results from refrerrable pathology show in general a much higher incidence of all types of pathology at the Oregon Optometric Center (16% of the total patient population) when compared to the Pacific University Optometric Clinic (5% of the total patient population). Although no statistically significant difference could be deleted from the two populations, there is the suggestion of a trend.

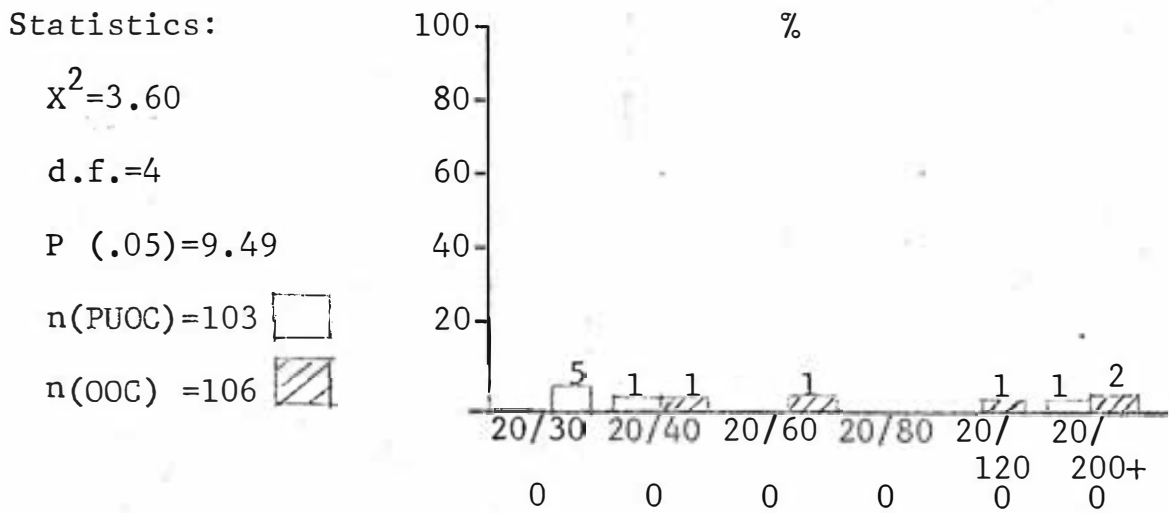
Figure 8: Referrable Pathology versus number of patients



2. Amblyopia (V.A. in the amblyopic eye)

The data from Figure 9 and Table I shows that 5% of the patients had an amblyopic visual acuity (AVA) of 20/30 at the Oregon Optometric Center. This is followed by an AVA of 20/200 (2%), AVA 20/40 (1%), AVA 20/60 (1%), AVA 20/120 (1%), and 20/80 (1%). The data from Figure 9 and Table II also shows the data for the Pacific University Optometric Clinic. The results show that an AVA of 20/40 (1%) and AVA of 20/200 (1%) make up the majority of the patients.

Figure 9: Amblyopic Visual Acuity versus number of patients



Amblyopic visual acuities of 20/30, 20/60, 20/80, and 20/120 all showed 0% incidence. The results in the amblyopic visual acuity sub-category again did not show a statistically significant difference between the two clinical populations.

However, there is a much higher incidence of amblyopia of all degrees (10% of the total population, Figure 9) at the Oregon Optometric Center as compared to the Pacific University Optometric Clinic (2% of the total population, Figure 9). No significant difference could be detected statistically, because of the small sample size, although these are indicated.

#### Heterophoria (Non-presbyopes)

##### 1. Heterophoria (no. 8) or tropia at far

The data in Figure 10 and Table I shows that 56% of the patients at the Oregon Optometric Center are between 0-4 exophoria. This is followed by 1-5 esophoria (29%), 5-9 exophoria (5%), 6 esophoria (5%), and greater than 10 exophoria (0%). Although the data suggests that no tropia exists at the Oregon Optometric Center, we know that this is not true and we can only attribute this artifact to the method of data collection. The data from Figure 10 and Table II also shows the results from the Pacific University Optometric Clinic. The majority of patients showed 0-4 exophoria (56%). This is followed by 1-5 esophoria (30%), 6 esophoria (4%), 5-9 exophoria (4%), and greater than 10 exophoria (2%). These results show that basically the two populations are very similar with respect to the heterophoria

measured at far because of their normative distributions.

Figure 10: Heterophoria or Tropia at far versus number of patients

Statistics:

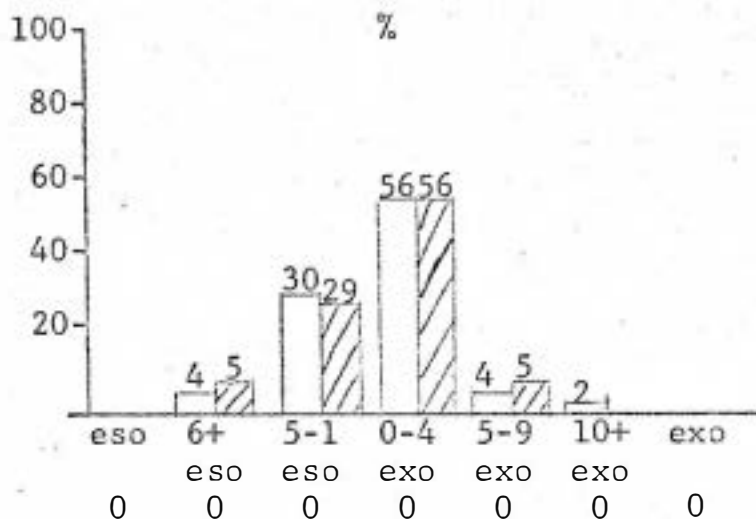
$$\chi^2=2.2258$$

$$d.f.=4$$

$$P (.05)=9.49$$

$$n(\text{PUOC})=103$$

$$n(\text{OOC})=106$$



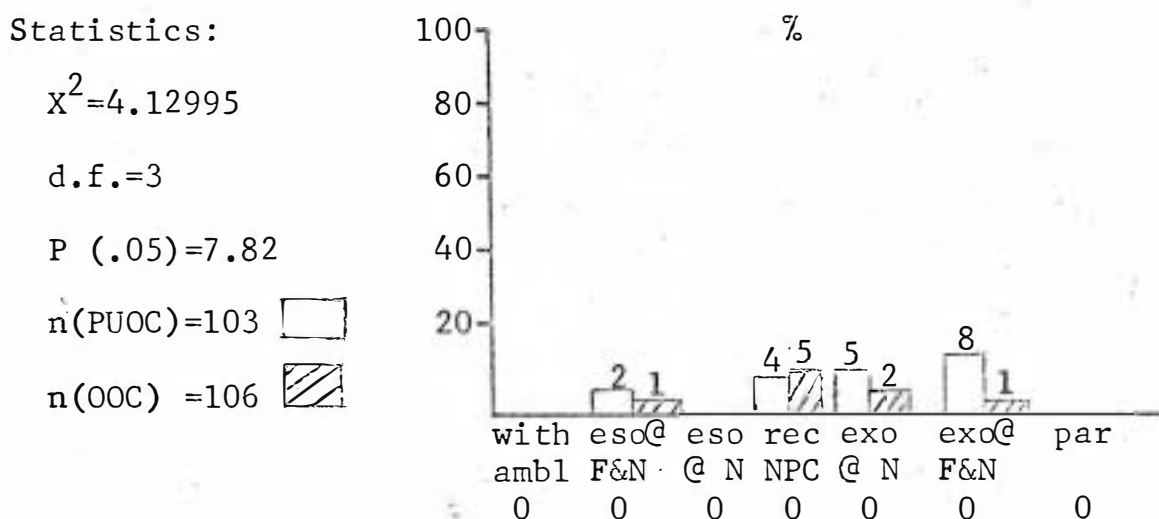
## 2. Habitual Heterotropia (at near or far)

The results from Figure 11 and Table I shows that 5% of the population at the Oregon Optometric Center have a receded near point of binocularity. This is followed by exotropia at near (2%), exotropia at far and near (1%), esotropia at far and near (1%), with amblyopia, esotropia at near, parietic, 0% each. The results from Figure 11 and Table II also shows the data from Pacific University Optometric Clinic. The majority of cases show exotropia at far and near (8%) followed by exotropia at near (5%), receded near point of binocularity (4%), esotropia at far and near (2%), with amblyopia, esotropia at near, parietic, both 0%. The results from the habitual heterotropia sub-category



indicate that there is no significant difference between the two populations. However if we compare the total incidence of all types of heterotropia we find that there is a much higher incidence at Pacific University Optometric Clinic (19% of the total population, Figure 11) than at the Oregon Optometric Center (9% of the total population, Figure 11).

Figure 11: Habitual Heterotropia at far or near versus the number of patients

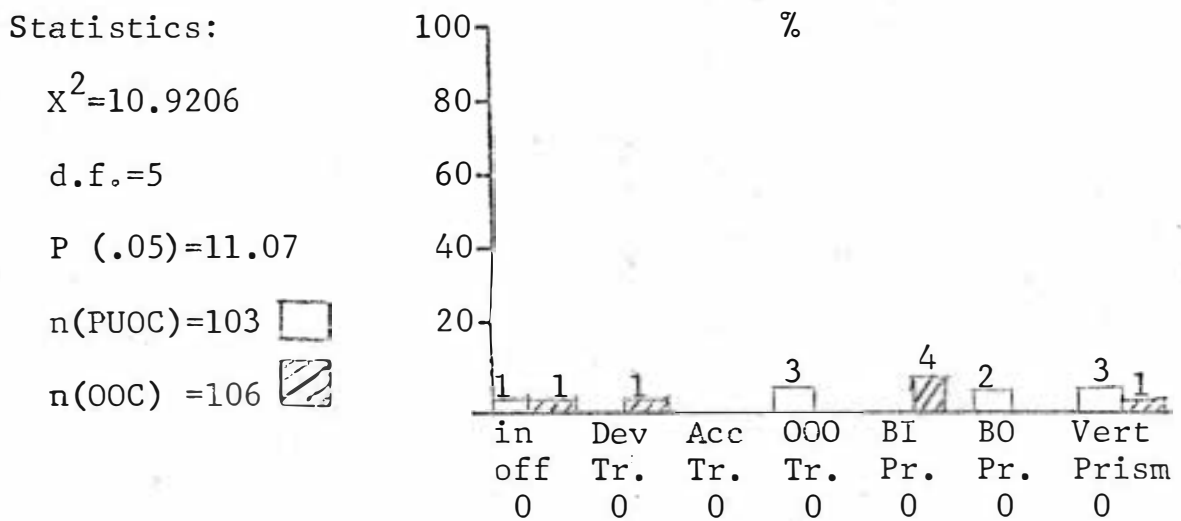


### 3. Visual training and/or binocular therapy

The data in Figure 12 and Table I shows that for the Oregon Optometric Center, 4% of the population were prescribed base-in prism. This is followed by vertical prism (1%), in office training (1%), developmental training (1%), accommodative training, out of office visual training, and base-out prism all 0%. The data from Figure 12 and Table II also shows the results for Pacific University

Optometric Clinic. The results show that vertical prism (3%) and out of office training (3%) were used most frequently. This is followed by base-out prism (2%), in office training (1%), developmental training, accommodative training, and base-in prism all 0%.

Figure 12: Visual training and/or binocular therapy for pre-presbyopes versus the number of patients



These results show that all types of training and binocular therapy indicated for pre-presbyopic patients is not significantly different for both of the clinical groups. Only 9% of the total population at Pacific University Optometric Clinic needed visual training or binocular therapy, while 7% of the population at the Oregon Optometric Center indicated a need for this type of optometric care. The time of the year in which the data was taken was a very influential factor because most visual training had already commenced.

## Presbyopia

### 1. Binocular Therapy for Presbyopes

The results in Figure 13 and Table I shows that at the Oregon Optometric Center the majority of clinicians gave no prism (11%). The other groups showed 0% except for base-in at near which was 4% of the patients. The data in Figure 13 and Table II also shows the results for Pacific University Optometric Clinic. Twenty six percent of the clinicians gave no prism. All the rest of the categories showed 0% except for base-in at near which was 1%

Figure 13: Binocular Therapy for Presbyopes versus number of patients

Statistics:

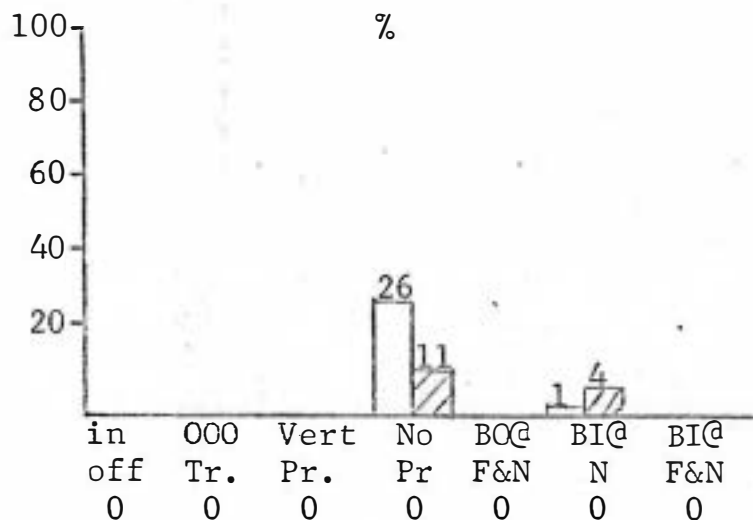
$$\chi^2 = 5.252$$

$$d.f. = 2$$

$$P (.05) = 5.99$$

$$n(\text{PUOC}) = 103 \quad \square$$

$$n(\text{OOC}) = 106 \quad \text{hatched square}$$



## 2. (14B Gross) - (Hab. Rx at near)

The results in Figure 14 and Table I for the Oregon Optometric Center shows that the majority of clinicians gave 2.00D or greater (11%). This is followed by 1.5D (4%), 0.50D (4%), 0.25D (4%), 1.0D (1%), 0.75D and 1.75D both 0%. The data in Figure 14 and Table II also includes the results for Pacific University Optometric Clinic. The results show that the majority of clinicians gave 0.25D (10%) difference. This is followed by 0.50D (8%), 0.75D (4%), 1.0D (4%), 1.5D (4%), 1.75D (1%), and greater than 2.0D (3%).

Figure 14: (14B Gross) - (Hab. Rx @ Near for Presbyopes) versus number of patients

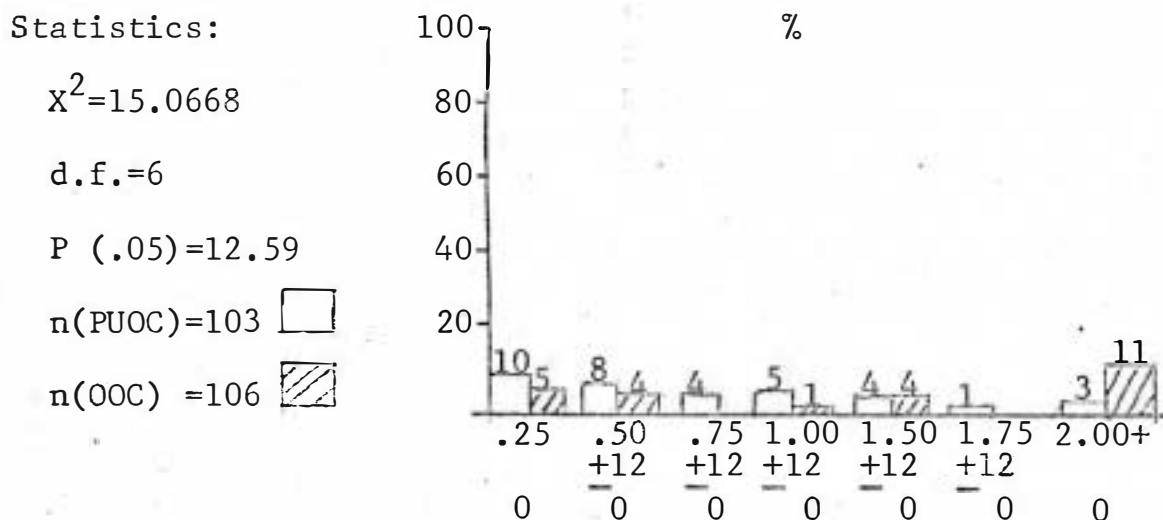


Table VI shows a chi square value comparing change in presbyopic add given with the change in total near point of the non-presbyope at the Pacific University Optometric Clinic. The chi square value is not significant between

these two categories. Table V shows a chi square value comparing change in presbyopic add given with the change in total near point of the non-presbyope at the Oregon Optometric Center. The chi square value shows a highly significant difference between the two categories. In summary, there is a statistical difference between change in the near prescription for the pre-presbyope and non-presbyope at the Oregon Optometric Center. This statistical significance was not apparent when comparing these two sub-categories for the Pacific University Optometric Clinic.

Near Prescription (Non-presbyope)

1. (14B Gross) - (Hab. Rx @ Near)

The data in Figure 15 and Table I for the Oregon Optometric Center shows that the greatest difference is 1.0D (14%) and 1.5D (14%). This is followed by 2.0D or greater (12%), 0.25D (11%), 0.50D (10%), 0.75D (8%), and 1.75D (5%). The data from Figure 15 and Table II also shows the results for the Pacific University Optometric Clinic. The greatest change is 1.5D (14%) followed by 0.25D (13%), 1.0D (12%), 0.75D (8%), 2.0D or greater (4%), 0.50D (3%), and 1.75D (0%). These results show no significant difference between the two clinical populations with regard to the 14B Gross minus the habitual prescription at near.

Figure 15: (14B Gross) - (Hab. Rx @ Near) versus the number of non-presbyopic patients

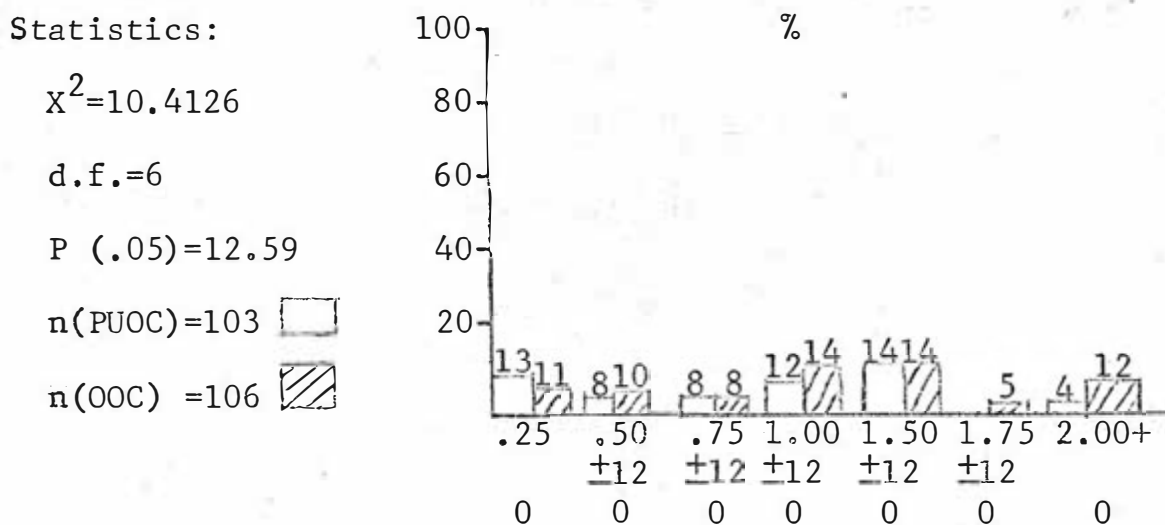


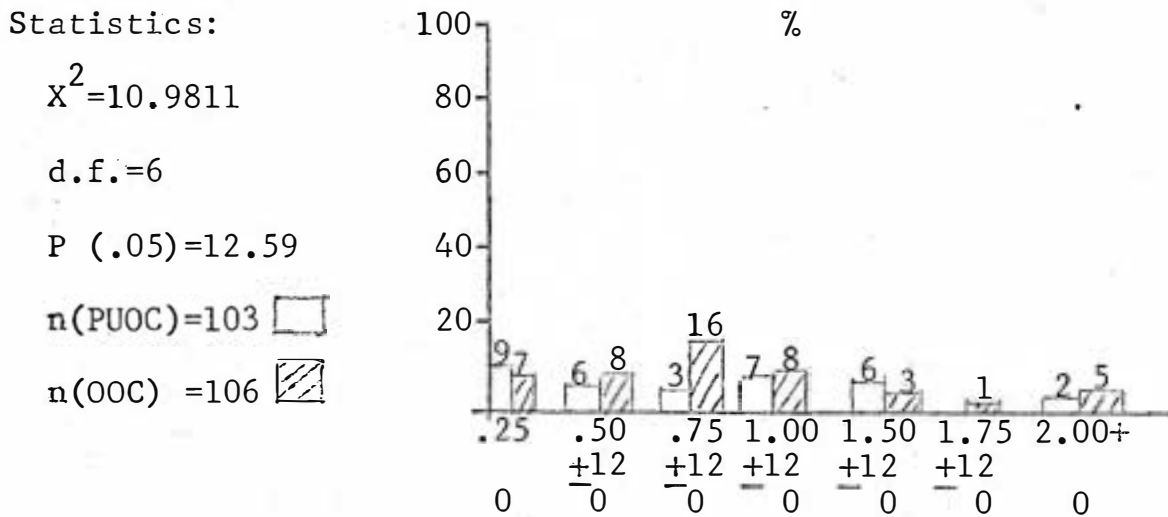
Table VI shows the chi square value comparing the 14B Gross minus the habitual Rx for the non-presbyope with the total near point Rx minus the habitual near Rx for the non-presbyope at the Pacific University Optometric Clinic. The chi square value is not significant between these two categories. Table V shows the chi square value comparing the 14B Gross minus the habitual Rx for the non-presbyope with the total near point Rx minus the habitual near Rx for the non-presbyope at the Oregon Optometric Center. The chi square value shows a significant difference between the two categories. In summary, these results show that there is a significant difference between the 14G gross minus the habitual prescription and the total near point prescription minus the habitual near prescription for non-presbyopes at the Oregon Optometric Center. This significant difference

was not evident for the Pacific University Optometric Clinic population.

2. (Prescribed Total Near Point) - (Habitual Total Near Point)

The data in Figure 16 and Table I shows that the majority of clinicians prescribe a difference of 0.75D (16%) at the Oregon Optometric Center. This is followed by 1.0D (8%), 0.50D (8%), 0.25D (7%), 2.0D or greater (5%), 1.5D (3%), and 1.75D (1%). The data from Figure 16 and Table II also shows the results for the Pacific University Optometric Clinic. Nine percent of the patients showed a difference of 0.25D followed by 1.0D (7%), 0.50D (6%), 1.5D (5%), 0.75D (3%), 2.0D or greater (2%), and 1.75D (0%).

Figure 16: (Prescribed Total Near Point) - (Habitual Total Near Point) versus the number of non-presbyopic patients



The results (Figure 16) show that in general there is a greater frequency of change in the total near point for non-presbyopes at the Oregon Optometric Center as compared to the Pacific University Optometric Clinic. However, these results were not statistically significant.

### Far Prescription

#### 1. (Myopic sphere equivalent) - (Habitual sphere equivalent)

The data from Figure 17 and Table I shows that the Oregon Optometric Center gives 9% of the patients a difference of 0.25D. This is followed by 0.75D (8%), 0.50D (7%), 1.0D (6%), 1.5D (5%), 2.0D or greater (4%), and 1.75D (1%). The data from Figure 17 and Table II also shows the results of the Pacific University Optometric Clinic. The results show that 16% of the population was given a difference of 0.25D followed by 0.50D (6%), 0.75D (3%), 1.0D (2%), 1.5D (1%), 2.0D or greater (1%), and 1.75D (1%). Figure 17 results show that the change in the myopic spherical equivalent is greater at the Oregon Optometric Center than at the Pacific University Optometric Clinic for all degrees of change (except for the 0.25D group).

Table VI shows a chi square value comparing the far myopic prescription with the far hyperopic prescription at the Pacific University Optometric Clinic. The chi square value shows a significant difference between the two.



Figure 17: (Myopic Spherical Equivalent Prescribed) - (Habitual Spherical Equivalent) versus the number of patients

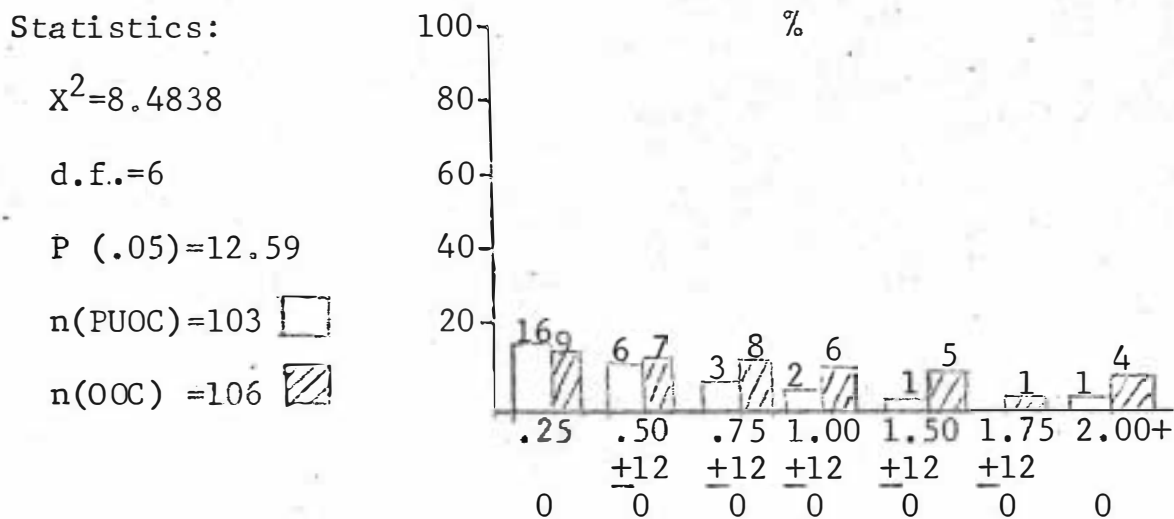


Table V shows a chi square value comparing the far myopic prescription with the far hyperopic prescription at the Oregon Optometric Center. These results comparing the changes in the myopic and hyperopic spherical equivalents show a statistical significance for the patients from Pacific University Optometric Clinic. However a statistically significant difference was not apparent for these two sub-categories in the Oregon Optometric Center population.

2. (Hyperopic sphere equivalent) - (Habitual sphere equivalent)

The data in Figure 18 and Table I shows that for the Oregon Optometric Center 13% of the population show a change of a 0.25D. This is followed by 0.75D (8%), 0.50D (5%), 1.0D (3%), 2.0D or greater (3%), 1.5D (1%), and 1.75D (1%).

The data from Figure 18 and Table II shows that for the Pacific University Optometric Clinic the majority of patients show a change of 0.50D (9%), followed by 0.75D (8%), 0.25D (7%), 1.0D (1%), 1.5D, 1.75D, 2.0D or greater, all 0%. These results, while not statistically significant, show more changes of the hyperopic spherical equivalent in all groups at the Oregon Optometric Center (34% of the total population) as compared to the Pacific University Optometric Clinic (29% of the total population).


Figure 18: (Hyperopic Spherical Equivalent Prescribed) - (Habitual Spherical Equivalent) versus the number of patients


Statistics:

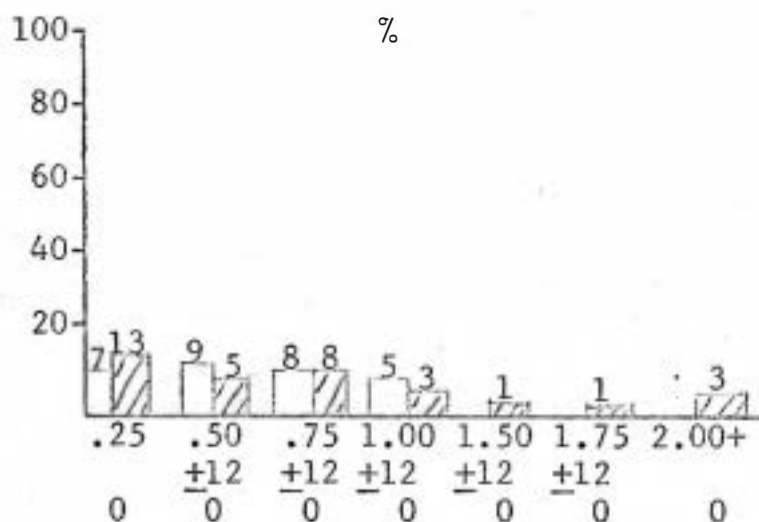
$$\chi^2 = 8.48829$$

d.f. = 6

P (.05) = 12.59

n(PUOC) = 103 

n(OOC) = 106 



### 3. (Magnitude of cylinder in Rx) - (Magnitude of Cylinder in Habitual)

The data in Figure 19 and Table I shows 18% of the population of the Oregon Optometric Center have a change of 0.50D. This is followed by 0.25D (15%), 0.75D (11%), 1.0D

(6%), 2.0D or greater (3%), 1.5D (2%), and 1.75D (1%). The data in Figure 19 and Table II shows 21% of the population of the Pacific University Optometric Clinic have a change of 0.25D. This is followed by 0.50D (13%), 0.75D (3%), 1.0D (2%), 1.5D (1%), 2.0D or greater (1%), and 1.75D (0)%. The results from Figure 19 show more changes in the magnitude of the cylindrical prescription for the patients of the Oregon Optometric Center. This is true for all degrees of change in the magnitude of the cylindrical prescription except for the 0.25D group.


Figure 19: (Magnitude of Cylinder in Rx) - (Magnitude of Cylinder in Habitual) versus the number of patients


Statistics:

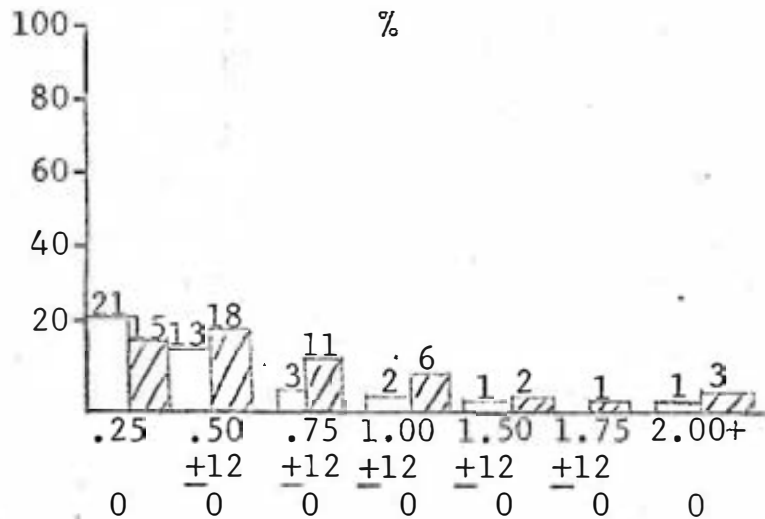
$\chi^2=9.2051$

d.f.=6

P (.05)=12.59

n(PUOC)=103 

n(OOC) =106 



## CONCLUSIONS

### Case History

In general, it can be concluded that the characteristics of the Oregon Optometric Center are as follows:

- 1) Most patients (44%) go five years or greater without visual care.
- 2) Most patients (86%) have had medical or dental care within the last year. We feel that this is due to the high level of institutionalized medical care which the patients of the Oregon Optometric Center receive.
- 3) The most frequent patient (42%) at the Oregon Optometric Center was between fifteen and twenty-nine years of age.
- 4) As predicted, there is a high incidence (82%) of patients at the Oregon Optometric Center from the urban area.
- 5) There is a high frequency of visual complaints of all types from the patients at the Oregon Optometric Center.
- 6) The majority of the patients at the Oregon Optometric Center (55%) have only a grade

school or high school education.

Similarly, the general characteristics of the Pacific University Optometric Clinic are:

- 1) Most patients (59%) at the Pacific University Optometric Clinic have received medical attention within the last year.
- 2) The recency of these patient's last visual exam is fairly well distributed throughout the five choices within this sub-group.
- 3) As would be predicted, the residence of the Pacific University Optometric Clinic patients were from either town or rural areas (63%).
- 4) The ages of the patients are fairly evenly distributed within the six age groups, with the highest frequency of patients being in the fifteen to twenty-nine age bracket.

By comparing the Oregon Optometric Center with the Pacific University Optometric Clinic patient population, we found those patients of the Oregon Optometric Center:

- 1) To have a higher incidence of people with a vocational education, and a lower frequency of people achieving a college education.
- 2) To have a lower incidence of patients showing an entrance habitual acuity of 20/20 -

(57% Oregon Optometric Center: 80% Pacific University Optometric Clinic).

- 3) To have a higher number of patients with patent symptoms of all types.
- 4) To have a marked difference between the last visual examination and the last medical examination.

At Pacific University Optometric Clinic there was a significant difference between the last visual and last medical care provided. However this difference was not nearly as marked as the difference between these two sub-categories for the patients at Oregon Optometric Center. The results from the contingency coefficient analysis of the last visual examination indicate that this sub-category cannot be an indicator in predicting patient symptomology, entrance habitual visual acuity, or the age of the patient for either of the two clinical groups.

### Pathology

The sample size in this category is too small to make any meaningful statistical conclusions. However, there are certain "trends" within this category that are indicated. These "trends" are:

- 1) A higher incidence in all types of pathology

and refrerrable pathology at the Oregon Optometric Center.

- 2) A higher incidence of amblyopia of all degrees at the Oregon Optometric Center.

These "trends" might have been statistically significant with a larger sample.

### Heterophoria (Non-presbyopes)

In comparing the Oregon Optometric Center with Pacific University Optometric Clinic the following conclusions can be drawn:

- 1) There is no significant difference between patient populations for the heterophoria at far, that is, both populations follow a normal distribution.
- 2) There is a higher incidence of habitual heterotropia of all types at Pacific University Optometric Clinic as compared to the Oregon Optometric Center, although the difference between these two populations is not significant for this sub-category.

The sub-categories within this area might have been significant, if the sample sizes from both populations had been larger.

### Presbyopia

In comparing the binocular therapy at the Oregon Optometric Center and Pacific University Optometric Clinic we found no significant differences. In fact this subcategory was statistically meaningless. However, we did find a significant difference between the 14B gross minus the habitual prescription at near for Pacific University Optometric Clinic and Oregon Optometric Center. We feel that this difference may be due to Pacific University out patient's population obtaining more frequent changes in their near prescriptions. Also the Oregon Optometric Center showed the highest incidence of change in the near prescription at the +2.00D level.

### Far Prescription

In general we found no significant differences between the two populations under all the far prescription categories. However, the results indicated certain trends within the patient populations which may become significant with larger sample sizes. These trends are as follows:

- 1) The Oregon Optometric Center patient population showed more frequent changes in the myopic spherical equivalent for all magnitudes of change except for the 0.25D group.



- 2) The Oregon Optometric Center population also shows more frequent changes in the hyperopic spherical equivalent for all magnitudes of change except for the 0.50D group.
- 3) There is also a greater frequency of change in the magnitude of the cylindrical prescription for all magnitudes of change in the Oregon Optometric Center clinical population.

However, significant results were indicated in comparisons between the myopic and hyperopic spherical equivalents for the Pacific University Optometric Clinic sample. These results were not significant for the Oregon Optometric Center population. Again we feel the failure to attain a significant difference between the two samples within the far prescription sub-categories is due to the small sample sizes that appeared.

#### Recommendations for Future Study

From this pilot study of clinical populations the following recommendations are suggested to subsequent investigators:

- 1) Larger sample sizes must be taken to assure significant data in many of the categories. We suggest that a patient population of no less than 1,000 be taken.

- 2) A more efficient questionnaire should be devised so that optometrists can more easily mark the appropriate categories. We also feel that the optometrist must be properly indoctrinated as to how the form should be filled out.
- 3) A better means of delivering these questionnaires to the optometrist should be developed.

From this pilot study we hope that an efficient data retrieval system can be devised.

## FOOTNOTES

- <sup>1</sup>Based on personal communication from A. N. Haffner, O.D., Ph.D., to E. L. Hunter, O.D., March 20, 1970.
- <sup>2</sup>Based on personal communication from H. B. Peters, O.D. to E. L. Hunter, O.D., February 24, 1970.
- <sup>3</sup>Baldwin, W. R., O.D., Ph.D. "Data Processing of Optometric Findings," Journal of the American Academy in Optometry. Vol. 40, No. 10, 622-628.

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APPENDIX A

Form for Comparison Study of  
Clinical Populations

## COMPARISON STUDY OF CLINICAL POPULATIONS

INSTRUCTIONS: Please blacken in the appropriate circle(s). If any questions arise, consult the accompanying sheet or contact Dick Robins, Mike Magliocco, or Paul Diedrich. Note, for those values in brackets record only the total difference as no signs are needed. Thank you.

Patient's Name _____	Date _____	Clinic _____	OGC 0	PUCO 0	Sex	M 0	F 0
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**CASE HISTORY**

1. Last Visual Examination	6 mos. 0	1 yr. 0	2 yr. 0	3 yr. 0	4 yr. 0	5 yr. 0	
2. Most Recent Medical or Dental Examination	6 months 0	1 yr. 0	2 yr. 0	3 yr. 0	4 yr. 0	5+yr. 0	
3. Age of the Patient	1-6 yrs. 0	7-14 yrs. 0	15-29yrs. 0	30-44yrs. 0	45-60yrs. 0	60+ yrs. 0	
4. Patient's Residence	Urban 0	City 0	Suburb 0	Town 0	Rural 0	Other 0	
5. Patient's Education	Grade School 0	High School 0	College 0	Vocat. 0	Other 0		
6. Visual History and Symptomology	Blur @ N 0	Blur @ F 0	Asthenopia 0	Talk 0	Diplopia 0	Headache 0	Other 0
7. Entrance Habitual Acuity (better eye)	20/20 0	20/30 0	20/40 0	20/60 0	20/80 0	20/120 0	20/200+ 0

**PATHOLOGY**

1. Referrable Pathology	External 0	Corneal 0	Iris 0	Lens 0	Retinal 0	Referral 0	
2. Amblyopia (V.A. in the Amblyopic Eye)	20/30 0	20/40 0	20/60 0	20/80 0	20/120 0	20/200+ 0	

**HETEROPHORIA (non-presbyopes)**

1. Heterophoria (no. 8) or tropia at far	esotropia 0	6+ eso 0	5-1eso 0	0-4 exo 0	5-9 exo 0	10+exo 0	exotropia 0
2. Habitual Heterotropia (at near or far)	with Ambly. 0	Eso. @ F & N 0	Eso. @ N 0	Receded NPC 0	Exo. @ N 0	Exo. @ F & N 0	Paretic 0
3. Visual training and/or Binocular Therapy	In Office 0	Dev. Training 0	Accom. Training 0	0-0-0 Training 0	BI Prism 0	BO Prism 0	Vertical Prism 0

**PRESBYOPIA**

1. Binocular therapy for presbyopes	In Office 0	0-0-0 Training 0	Vertical Prism 0	No Prism 0	BO @ F & N 0	BI @ Near 0	BI @ F & N 0
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2. [14B Gross] - [Hab. Rx] @ near	RECORD .25 0	THE GREATEST CHANGE FROM HABITUAL OD or OS .50 ±.12 0	.75 ±.12 0	1.00 ±.12 0	1.50 ±.12 0	1.75 ±.12 0	2.00+ 0
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**NEAR PRESCRIPTION (non-pres.)**

1. [14B Gross] - [Hab. Rx @ near]	0	0	0	0	0	0	0
2. [Prescribed - [Habitual TNP]	0	0	0	0	0	0	0

**FAR PRESCRIPTION**

1. [Myopic Sph. - [Hab. Equiv. Prescribed] Sph. Equiv.]	0	0	0	0	0	0	0
2. [Hyperopic Sph. - [Hab. Sph. Equiv. Prescribed] Equiv.]	0	0	0	0	0	0	0
3. [Magnitude of Cylinder in Rx] - [Magnitude of Cylinder in Hab.]	0	0	0	0	0	0	0

## COMPARISON STUDY OF CLINICAL POPULATIONS (con't)

### SPECIAL INSTRUCTIONS:

*NOTE— More than one circle may be filled in when indicated. If any category is inappropriate, leave it blank.*

#### Case History

- 1&2. Record the time from his last examination to the time of his present visual exam.
- 4&5. These are the only two items which you normally do not take in your case history. We leave the filling in of the patient's residence to your discretion, but The patient's education refers to the last school that he has completed.

#### Presbyopia, Near Rx and Far Rx.

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Except for Binocular Therapy for Presbyopes, the last five categories are **prescription** categories. You are to record only the difference between the two quantities in brackets. No sign is needed. For any change greater than 2.00<sup>D</sup> mark in the 2.00+ column. Please record whether change is greater in the right eye or the left eye. If the spherical equivalent is in minus (your prescription) use the myopic category and if in plus use the hyperopic category. For the cylinder Rx record only the change in magnitude.



APPENDIX B

## PROBLEMS WE HAD WITH THE QUESTIONNAIRE

The questionnaire devised to study the differences between the two clinical populations is carefully laid out to avoid any confusion which might arise. Most of the questionnaire is devised so that it will be self-explanatory, however specific instructions are provided for those areas where difficulties may arise. In general, we feel that the form is self-explanatory, however the six prescription sub-categories (Presbyopia #2, Near prescription #1 and #2, and Far prescription #1, #2, and #3) did cause difficulties for several student clinicians. We feel that many of the difficulties that arose from filling out the prescription sub-categories were due to a  $1.25D \pm 0.12D$  blank being inadvertently left out in our final form. This mistake decreased the sensitivity of the prescription criteria sub-category measures. We feel that this mistake would not have rendered the data significant however, because of the small sample sizes in these sub-categories.

There were also several sub-categories under Heterophoria for non-presbyopes which should be reorganized to develop meaningful statistics in this area. Sub-category One, Heterophoria or #8 at far, should not include esotropia or exotropia at far. This correction will eliminate the

confusion of this sub-category with the Habitual Heterotropia sub-category. Under Presbyopia the sub-category Binocular Therapy for presbyopes, should include decentration of lenses and the no prism blank should be dropped. The Pathology heading should also include visual field defects under the refrerrable pathology sub-category. These are the corrections which should be initiated on the questionnaire if it is to be used for further study.

The questionnaire should also be reworked in an attempt to decrease its length. Some of the sub-categories which we found statistically insignificant may be eliminated. Those sub-categories which may be deleted from the study are: Heterophoria (#8) at far and the Magnitude of the Cylinder in the prescription minus the magnitude of the cylinder in the habitual prescription. However, these categories should be included in population studies where they are significant.

This questionnaire could be the basis of a nationwide survey of all optometrists to determine the significance between various populations throughout the nation. However, we hope that this pilot study and questionnaire will become the cornerstone of any clinical surveys made between the Oregon Optometric Center and Pacific University Optometric Clinic in the near future.