5-1995

Gender comparisons of the anthropometric dimensions of optometry students and professionals and the need to reconsider human factors engineering to accommodate the changing demography of the optometric profession

Anita Ghazarian
Pacific University

Michele Bither
Pacific University

Gender comparisons of the anthropometric dimensions of optometry students and professionals and the need to reconsider human factors engineering to accommodate the changing demography of the optometric profession

Abstract

The large shift towards more women in optometry necessitates ergonomic reconsideration of tools, equipment and workstations, because of gender size differences. This study focused on the anthropometric component of ergonomics; 33 men and 33 women were measured for height and eight other parameters which may be important in equipment design. They were also asked if they sat or stood while performing an eye exam. The t-test comparison showed a very highly significant difference between genders for all parameters. Men's size made no difference in sitting or standing, whereas women's did. The level of significance was highest when comparing all subjects, which meant height, not gender, is the critical factor, especially for those on the shorter end. Equipment manufactures and designers should cater to a larger range of physical dimensions than in the past.

Degree Type

Thesis

Degree Name

Master of Science in Vision Science

Committee Chair

Salisa K. Williams

Subject Categories

Optometry

GENDER COMPARISONS OF THE ANTHROPOMETRIC DIMENSIONS OF OPTOMETRY STUDENTS AND PROFESSIONALS AND THE NEED TO RECONSIDER HUMAN FACTORS ENGINEERING TO ACCOMMODATE THE CHANGING DEMOGRAPHY OF THE OPTOMETRIC PROFESSION

by

ANITA GHAZARIAN

MICHELE BITHER

A thesis submitted to the faculty of the
College of Optometry
Pacific University
Forest Grove, Oregon
for the degree of
Doctor of Optometry
May, 1995

Adviser:

Salisa K. Williams, O.D.

(signature page)

Authors:

Anita Ghazarian

Michele Bither

Advisor:

Salisa K. Williams, O.D.

BIOGRAPHY

Anita Ghazarian attended Occidental College as an undergraduate where she earned a bachelor's degree in biology, with a special emphasis in marine biology, and a minor in philosophy. She worked as a research technician at Doheny Eye Institute and Norris Cancer Center for several years before enrolling at Pacific University's College of Optometry. She is a member of Beta Sigma Kappa Honor society, and will be the pediatric vision therapy resident at Southern California College of Optometry for 1995-96 academic year. She plans on entering a solo or partnership practice within the next five years, combining primary care and contact lenses, with pediatric and vision therapy.

Michele Rae Bither attended Humboldt State University in Arcata, CA, graduating cum laude with a major in Cellular/Molecular Biology. She is a lifetime member of Beta Sigma Kappa, and is a student member of AOSA, SOA, COVD, OEP, and AAO. Ms. Bither is very interested in Vision Therapy and plans to practice in the Astoria area after graduation.

ACKNOWLEDGMENT

We would like to thank Dr. Salisa Williams for all the help, advice, and support she has given us.

We would also like to thank Pacific University for allowing us to use the facilities, and Beta Sigma Kappa for their generous grant.

ABSTRACT

The large shift towards more women in optometry necessitates ergonomic reconsideration of tools, equipment and workstations, because of gender size differences. This study focused on the anthropometric component of ergonomics; 33 men and 33 women were measured for height and eight other parameters which may be important in equipment design. They were also asked if they sat or stood while performing an eye exam. The t-test comparison showed a very highly significant difference between genders for all parameters. Men's size made no difference in sitting or standing, whereas women's did. The level of significance was highest when comparing all subjects, which meant height, not gender, is the critical factor, especially for those on the shorter end. Equipment manufactures and designers should cater to a larger range of physical dimensions than in the past.

INTRODUCTION

The tremendous influx of women into the field of optometry and other eye care professions requires a revision of the professional tools and equipment. These tools have, until now, been designed with the male professional in mind. Many female optometrists and optometry students have voiced concern regarding dimensional parameters of most optometric equipment; moreover, they have subjective complaints regarding discomfort, fatigue and, consequently, lowered productivity. With better and more ergonomically designed equipment, the female practitioners will be less fatigued and more productive, resulting in better patient care. In addition, those companies who heed the changing needs of this target population will find that business and consumer satisfaction will increase. Unfortunately, very little data describing the relevant physical dimensions and characteristics of either male or female eye care practitioners exist.

Our objectives included compiling basic descriptive data for both males and females. We hypothesized that men's and women's physical dimensions were significantly different. We also tried to evaluate the relationship between physical dimensions, and the tendency of the practitioner to perform the vision exams while sitting or standing.

This study also intended to describe briefly the discipline of ergonomics and how it applies to optometric equipment design, and to illustrate the demographic shifts in optometry in recent years.

Ergonomics is the study of human behavioral and biological characteristics for the appropriate design of the living and working environment.[1] A distinction may be made between ergonomics and applied ergonomics; the former is viewed as the "study of humans to gather data and establish principles regarding human characteristics," whereas applied ergonomics is synonymous with humans factors engineering "[2]

The ergonomic database is divided into three major components: *human performance*, *biomechanics*, and *anthropometry*. Human performance concerns itself with motor skills and reactions; biomechanics examines muscular strength and coordination; while anthropometry studies body dimensions.[1] Each aspect of ergonomics needs to be evaluated through the particular perspectives of different disciplines. Our investigation was confined to examining anthropometry, since the measurement of the other components of ergonomics is beyond our expertise (Figure 1).

Ergonomic job considerations go beyond the relationship between human and tool because the individual is the central locus of the interrelationship between tool, task, and work station (Figure 2). Each aspect of this interrelationship merits careful evaluation. It is the responsibility of an ergonomist to evaluate all of the system and the interaction between the parts.[1] It is important to note that those interested in hiring an ergonomist should exercise caution selecting one because no certification process currently exists. The Human Factors Society and the American Industrial Hygiene Association are actively considering a certification process, yet for those interested in consulting an ergonomist, or further information on this topic should contact the Human Factors Society for a directory of domestic and international consultants, as well as continuing education courses [3,4,5].

In 1981, the U.S. Occupational, Safety and Health Administration (OSHA) first identified ergonomic principles as important in the prevention of work related cumulative trauma disorders.[6] "Since then, OSHA has cited industry for ergonomic hazards using the 'general duty clause' of the OSHA Act of 1970 and guidelines issued from the National Institute for Occupational Safety and Health (NIOSH).[6] OSHA's ergonomic guidelines are broad and generic, yet rules based on these guidelines are being considered for industry. The new rules, if adopted, would focus on the cumulative trauma disorder of the upper extremities and back in all workplaces.[6] Due in part to OSHA's regulations regarding cumulative trauma disorder, ergonomics has become a 'hot field' according to the American College of Occupational Medicine, and is receiving increasing attention from business.[6]

Aside from the discussion of ergonomics on a general basis, another more specific factor, gender differences, needs to be examined and considered. This factor is one of gender differences. Not long ago, gender differences in optometry could have been easily dismissed, because as recently as ten years ago, the number of female eye care professionals was so very small that it could have been considered statistically negligible; any hardware and equipment design which needed to accommodate women could be made only as a custom-made item. But the gender demographic profile of many professions, including eye care, has been shifting dramatically in the last decade. The Association of Schools and Colleges of Optometry (ASCO) regularly compiles demographic data on optometry schools. The current trends indicate a sharp increase in enrollment of female optometry students[7]. Though the disparity of the male-to-female ratio varies from school to school and from one year to the next, overall, women have outnumbered men in recent years (Figures 3, 4, and 5).

Similar changes in the male-to-female ratio found in optometry have been cited medicine, dentistry, pharmacy and engineering (Figure 6 and 7). It is important to note that in the case of medical schools, there would not have been enough qualified applicants to fill the entering class were it not for the increased applicant pool of qualified women.[8]

Historically, it was the Equal Employment Opportunity Legislation and Executive Order 11246, otherwise known as Affirmative Action, in 1968, boosted the interest, and opportunities of women, to enter nontraditional jobs previously dominated by men.[9] It seems, however, that affirmative action plays a lesser role in expanding opportunities for women in recent years.[8]

The current design of tools, equipment and workstations of most these professions, lag behind the demands of the gender shift. Studies show that for jobs that were primarily filled by male workers, the workplace is designed for the male body.[9] It may seem obvious that men and women are physically different, both in stature and body composition. Women are, on average, shorter than men of similar stature, have narrower shoulders, wider hips, and proportionally shorter legs and arms than their male counterparts.[9] The high prevalence of shoulder-neck disorders among women in industry has been associated with their weaker upper body muscle strength.[9] Women are forty to seventy percent weaker in upper body strength, while only five to thirty percent weaker in lower body strength.[9]

However, they are generally more flexible, with flexibility defined as "range of motion of joints or a series of joints that is influenced by muscles, tendons, ligaments, bones and bony structures."[9]

Ergonomic principles mandate designing the tool and the workplace to fit the worker, not making the worker fit the workplace. Strength, endurance, and flexibility should be considered in the safety of both male and female workers and changes must be made in the design of work stations, tools and equipment, work organizations, and load position and sizes, to accommodate their needs.[9]

One study by a member of the Association of Occupational Health Nursing, pointed to the dearth of studies comparing female and male musculoskeletal differences, and a lack of job specific comparisons.[9] According to US department of Health and Human Services, musculoskeletal injury is the leading cause of disability; it can be costly, and a source of lower productivity and decreased job satisfaction.[9]

In optometry and ophthalmology, no database for such comparisons exists. A thorough ergonomic database should include all three components of human performance, biomechanics and anthropometry--this study concerned itself with anthropometry only.

METHODS

Thirty-three male and thirty-three female optometry students and professors were randomly selected for testing at Pacific University College of Optometry. There were no age restrictions. Three different stations, each with its own examiner, were arranged to measure a variety of human dimensions. The same examiners were responsible for each set of measurements to allow for more consistent data collection. The subjects moved from one station to the next, carrying a data sheet for measurement recording. This sheet remained with the examiner at the final station. Finally, the subject was asked if he or she mostly stood or sat while performing an optometric exam. This parameter was named *sit/stand*.

STATION ONE:

1. *Height* was measured with a calibrated, metric, wall-mounted measuring device. Measurements were recorded to the nearest centimeter. This parameter may be significant in the design of the optometric chair and phoropter.

2. *Interpupillary Distance* (PD) was measured with a digital pupillometer. Near and far PD's were measured to the nearest millimeter. This parameter may be used in slit lamp and binocular indirect ophthalmoscope design.

STATION TWO:

All of the following measurements were taken using a cloth metric measuring tape. Each was recorded to the nearest tenth of a centimeter.

1. *Handspan* was measured by asking the subject to fully extend his/her hand and noting the distance between the thumb and the smallest finger. This parameter may be used in the design of the diagnostic set handle.

2. *Harmon distance* was a measurement of the distance between the tip of the middle knuckle of the fist to the bottom of the elbow. This parameter may be used in the design of the examination chair and phoropter.

3. *Head circumference* was measured by wrapping the measuring tape firmly around the subject's head, with the tape positioned slightly above the eyebrows and slightly below the inion. This parameter may be used in the design of the binocular indirect ophthalmoscope.

STATION 3:

1. *Eye-to-floor distance* was measured with the subject seated on a stool, shoes off, and with feet flat on the floor.

2. *Foot-to-knee distance* was measured with the subject seated on a stool, shoes off, and with feet flat to the ground.

3. *Palm-to-floor distance* was measured with the subject standing without shoes, arm extended straight down the side of the body towards the floor, and with the palm positioned parallel to the floor.

The parameters measured in Station 3 may be used to design comfortable stools, optometric examination chairs, and phoropters.

Fully reclined chairs should allow comfortable binocular indirect ophthalmoscope (BIO) operation for the practitioner.

RESULTS

Several types of statistics were compiled using the computer programs *Excel* and *Statvue*. We prepared unpaired, two-tailed t-tests using gender versus the measured parameters and sit/stand versus the measured parameters. We chose a t-test because there were two independent groups, men and women, and we wished to compare the mean values from each group. This comparison would indicate a statistically significant difference between the means of the two groups. We decided to use a conservative .01 significance level to determine statistical significance. Finally, we compiled some basic descriptive statistics for each group.

The t-tests revealed that when comparing gender to each measured parameter, there was a highly statistically significant difference between the means of the two subject groups (See Table 1).

We then wanted to determine if there was a relationship between the female subjects' complaints regarding standing for an examination and the measured parameters. Table 2 shows that for all subjects, all of the parameters were statistically significant except for near and far PD. Moreover, for the women, we found that height, eye-to-floor, foot-to-knee, and Harmon distance were all statistically significant. Lastly, for the men, we found that none of the measured parameters were statistically significant in regards to sitting versus standing.

We compiled basic descriptive statistics for all subjects and for each group separately. A summary of these results is in Table 3. The full set of descriptive statistics, including histograms, can be found in Appendix 1.

DISCUSSION

The original hypothesis that men and women have statistically significant differences in the tested parameters was confirmed. The order of significance in all parameters ranged from 0.0001 to 0.0055; near interpupillary distance (PD) was the least significant.

We found while analyzing women who sat while performing an eye exam and those who stood, that, height, eye-floor distance, foot-knee distance, and Harmon distance were the measures that were statistically significant (0.0015-0.0092). Twenty-one women from a sample size of thirty-three reported that standing was the preferred position during an eye exam. Most height related measurements were found to be statistically significant; there is, therefore a relationship between most of the height related dimensions and sitting or standing in women.

There was no statistically significant relationship between men's measured parameters and their preference to sit or stand during an eye exam. In other words, men's physical dimensions have little bearing on their tendency to sit or stand.

However, in men, none of the parameters had a statistical relationship to whether a male practitioner sat or stood. Only five men from a sample size of thirty-three stood during the majority of the time he performed an eye exam.

The validity of the men who stood category is much reduced due to the small sample size of five men only. The data may have been further skewed due to the fact that a tall male may have simply preferred to stand, rather than being required to do so, based upon stature.

The level of significance rose sharply when all subjects were considered together rather than categorized on the basis of gender. Once height and height related parameters were seen as a continuum, height itself appeared to be the critical entity, not gender.

Men are on the taller end of the height continuum, and consequently, sitting or standing makes little difference for them functionally; they appear to have less difficulty using the usual optometric equipment and workstation. Most women are on the shorter end of the height continuum where height becomes a critical factor. Within the population of female optometrists, those who are taller may have more of an option to sit or stand during an eye exam.

One weakness of this study was the high proportion of novice practitioners who may not have learned adaptations to compensate for their short stature. Another weakness was the small sample size of men who stand while performing an eye exam. This problem was not originally foreseen and would require a very large original sample size to ensure a large enough number of men in the standing category.

Because of the academic setting and the lacked access to a wide range of equipment options, many smaller-statured practitioners had little choice in selecting equipment which might have fit them better.

We recommend that future studies include a large sample of optometrists, with few students. Also, studies investigating biomechanics and human performance aspects of optometry are needed.

Equipment manufactures need to consider the shifting demography of eye care professionals; increasingly women and racial and ethnic minorities, many of whom have different dimensional profiles, are changing the face of optometry (Figure 8). They will require tools that better fit their needs, therefore it is economically advantageous for manufactures to evaluate their new consumer base and utilize this information in their equipment design.

TABLE 1: t-tests for Male versus Female Subjects

	Males	Females	Total	P-value
N	33	33	66	
Height	179.8 ± 7.8	163.3 ± 6.3	171.6 ± 10.9	< 0.0001
Far PD	62.6 ± 2.54	60.2 ± 2.4	61.4 ± 2.8	0.0002
Near PD	58.3 ± 2.4	56.6 ± 2.4	57.4 ± 2.5	0.0055
Handspan	21.5 ± 1.8	19.5 ± 1.2	20.5 ± 1.8	0.0001
Harmon dist.	38.9 ± 2.1	34.5 ± 1.8	36.6 ± 3.0	0.0001
Head circum.	59.0 ± 1.8	55.6 ± 1.3	56.8 ± 2.0	0.0001
Eye-floor	126.5 ± 7.3	121.2 ± 4.6	123.8 ± 6.6	0.0008
Foot-knee	56.7 ± 5.2	50.1 ± 2.3	53.4 ± 5.2	0.0001
Palm-floor	84.6 ± 4.5	77.5 ± 5.6	81.0 ± 6.2	0.0001

All measurements are in centimeters and rounded to the nearest 0.1 cm, except for near and far PD, which are expressed in millimeters and rounded to the nearest 0.1 mm.

TABLE 2: t-tests for Sit versus Stand

	Men			Women			All Subjects		
	sit		stand	sit		stand	sit		stand
n	28		5	12		21	40		26
	Sit mean	Stnd mean	P #	Sit mean	Stnd mean	P #	Sit mean	Stnd mean	P #
Height	181	175	.127	168	161	.002	177	164	.0001
Far PD	63	63	.795	60	61	.353	62	61	.291
Near PD	58	59	.732	56	57	.134	58	57	.855
Head cir.	58	58	.781	56	55	.266	57	56	.004
Eye-flr	127	122	.141	124	119	.002	126	120	.0001
Foot-knee	57	57	.968	52	49	.009	55	51	.0006
Palm-flr	85	83	.315	80	76	.084	83	78	.0001
Harmon dx	39	38	.213	36	34	.004	37	35	.0001
Handspan	21	22	.860	20	19	.034	21	19	.0019

P # refers to P value.

All measurements, excluding near and far PD, are in centimeters, rounded to the nearest centimeter for the purpose of this table. PD measurements are in millimeters, rounded to the next highest millimeter for the purpose of this table. Appendix 1 contains the original decimal numbers from which these were rounded.

TABLE 3: Basic Descriptive Statistics

All subjects (n=66)

	Minimum	Maximum	Range
Height	151	200	49
Far PD	56	69	13
Near PD	52	64.5	12.5
Head circum.	52.5	61.5	9
Eye-floor	113	157	44
Foot-knee	45	81	36
Palm-floor	58	97	39
Harmon distance	31	44	13
Handspan	14.5	25	10.5

All measurements were in centimeters and rounded to the nearest 0.1 cm, except for near and far PD, which were expressed in millimeters and rounded to the nearest 0.1 mm for calculations.

Ergonomic Databases

Disciplines Consulted	Knowledge Used
• Ergonomics	
○ Human performance	—Motor skills —Reaction
○ Biomechanics	—Muscular strength —Coordination
○ Anthropometry	—Body dimensions
• Psychology	—Attention —Motivation
○ Perception	—Sensory recognition
○ Cognition	—Memory —Decision making
• Life Sciences/Medicine	—Vision, audition, etc. —Human physiology —Effects of stress
• Engineering	—Time and motion analysis —Equipment design
• Personnel management	—Training techniques

FIGURE 1: Ergonomic Databases (from Sluchak, TJ. Ergonomics: Origin, Focus and Implementation Consideration. AAOHN J, 1992; 40(3):107).

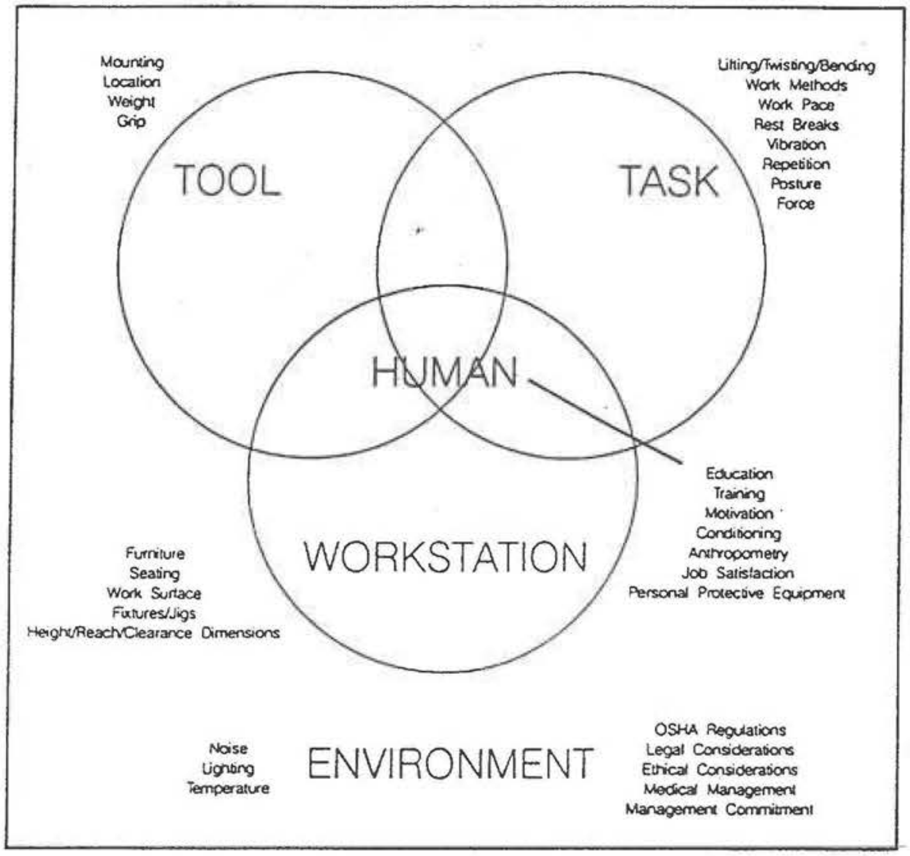

FIGURE 2: Ergonomic Databases (from Sluchak, TJ. Ergonomics: Origin, Focus and Implementation Consideration. AAOHN J, 1992; 40(3):107).

1992-93 ANNUAL SURVEY OF OPTOMETRIC EDUCATIONAL INSTITUTIONS: STUDENTS
01/26/94

1. Enrollment

a. Full-time students enrolled in the professional O.D. program

	First Year								
	Male				Female				Total
	Regular	Repeat	Transfer	Total	Reg	Rep	Trans	Total	1st Year
FSU	20	0	0	20	12	0	0	12	32
IAUPR	9	0	0	9	25	2	0	27	36
ICO	81	5	0	86	82	2	0	84	170
IU	39	0	0	39	32	0	0	32	71
NESUCO	11	0	0	11	13	0	0	13	24
NEWENCO	40	0	0	40	56	0	0	56	96
PCO	51	6	3	60	99	10	1	110	170
PUCO	44	0	0	44	41	1	0	42	86
SCCO	26	1	0	27	69	1	0	70	97
SCO	61	0	0	61	59	0	0	59	120
SEUCO	52	3	0	55	45	2	0	47	102
SUNY	36	0	0	36	36	0	0	36	72
TOSU	25	0	0	25	37	0	0	37	62
UAB	18	1	0	19	23	0	0	23	42
UCB	29	1	0	30	38	1	0	39	69
UH	49	1	0	50	54	1	0	55	105
UMSL	19	0	0	19	21	1	0	22	41
SCHOOL TOTALS	610	18	3	631	742	21	1	764	1395

FIGURE 3: 1992-93 Annual Survey of Optometric Educational Institutions: Students 01/26/94 (From Associated Schools and Colleges of Optometry).

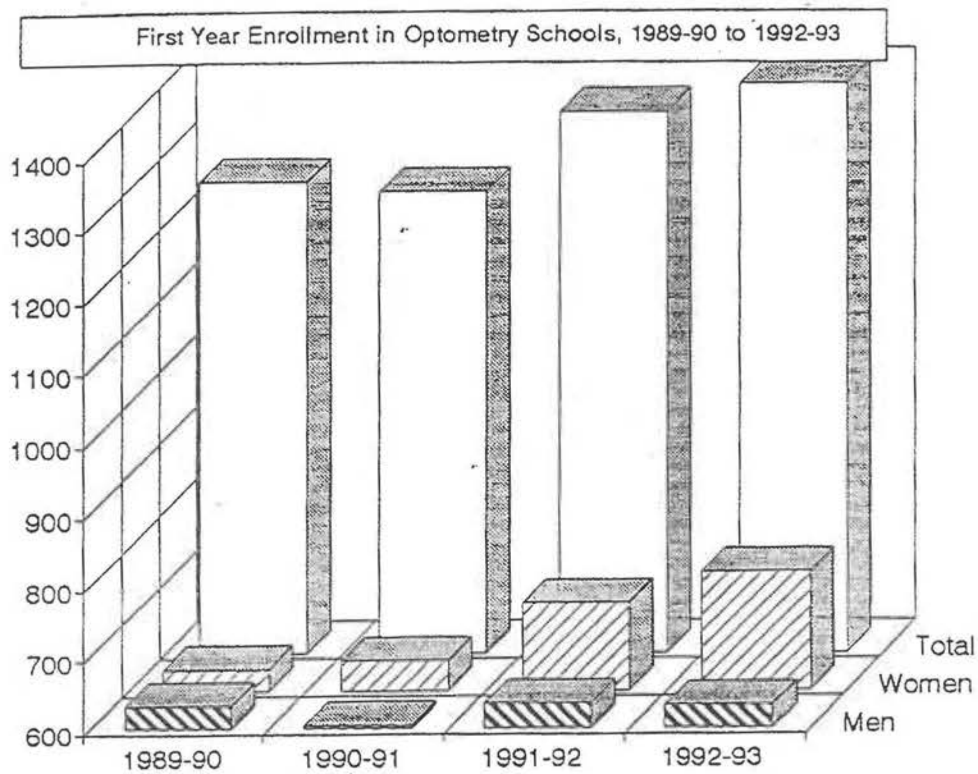

FIGURE 4: First Year Enrollment In Optometry Schools 1989-90 to 1992-93 (Taken from Association of Schools and Colleges of Optometry: Trends in Optometry Education. ASCO, 1994).

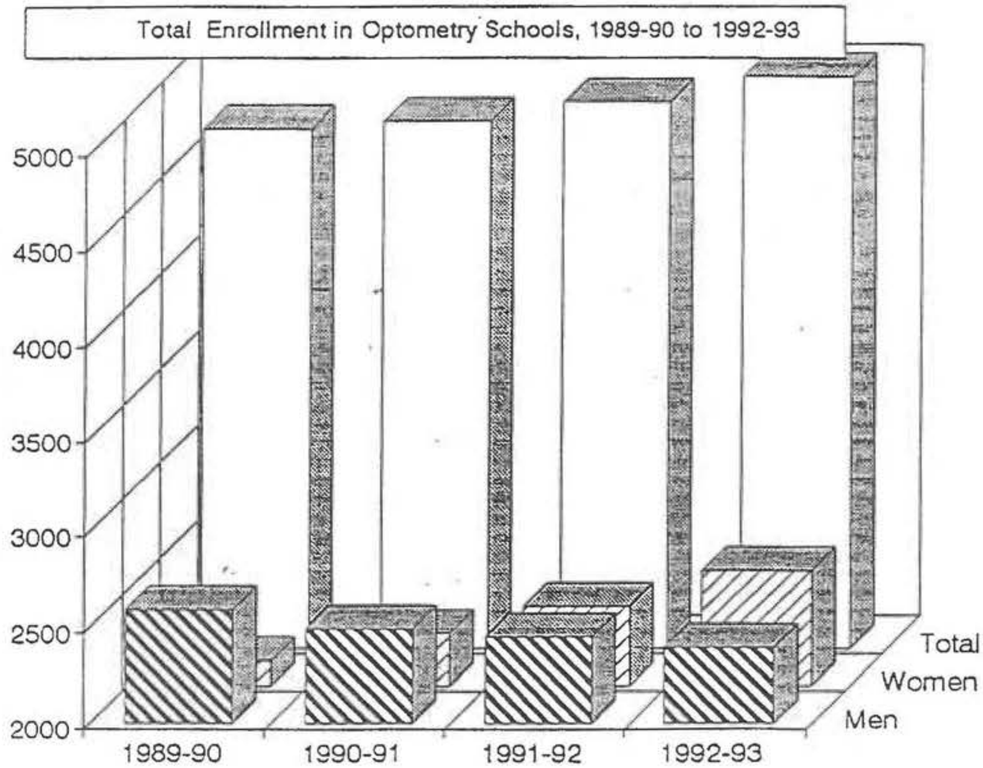

FIGURE 5: Total Enrollment In Optometry Schools, 1989-90 to 1992-93 (Taken from Association of Schools and Colleges of Optometry: Trends in Optometry Education. ASCO, 1994).

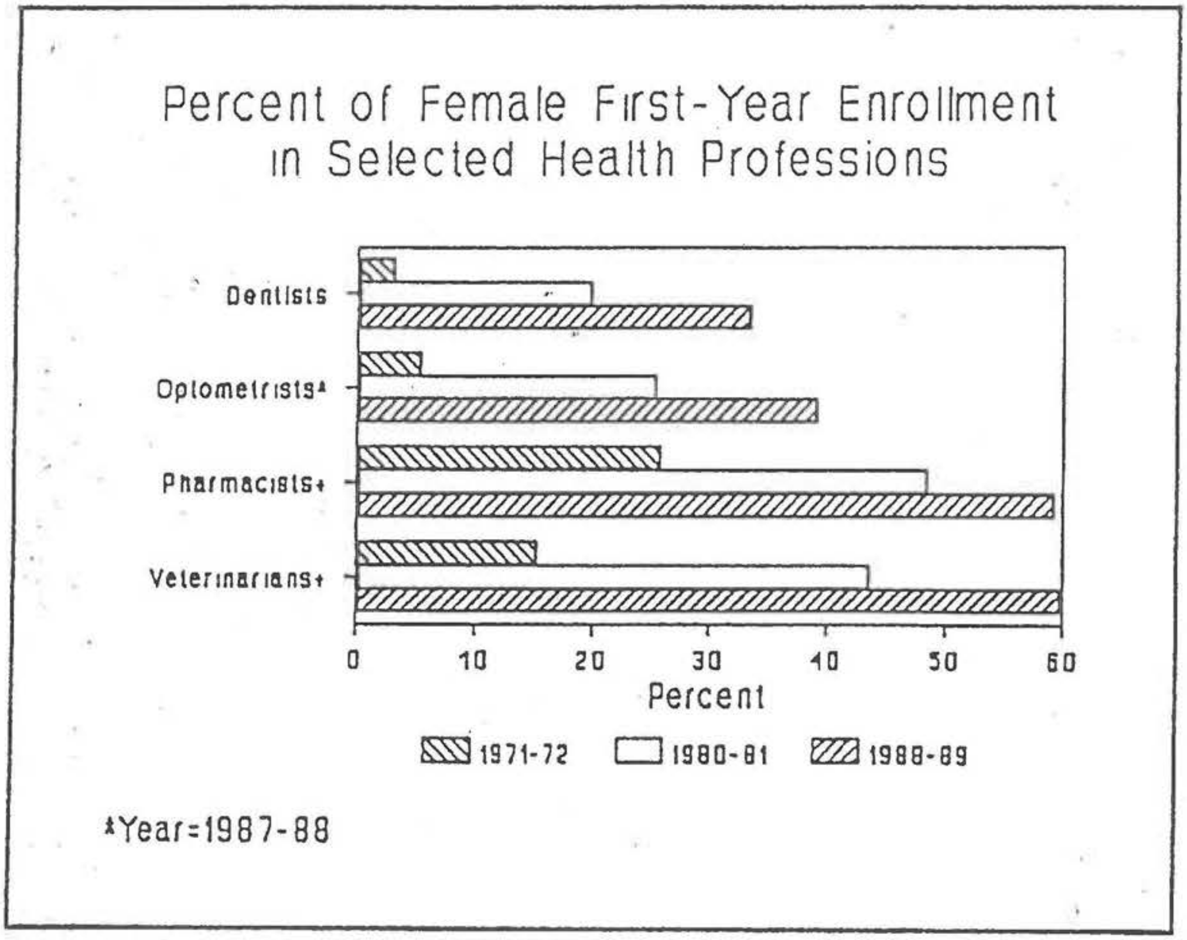

FIGURE 6: Total Enrollment In Optometry Schools, 1989-90 to 1992-93 (Taken from Association of Schools and Colleges of Optometry: Trends in Optometry Education. ASCO, 1994).

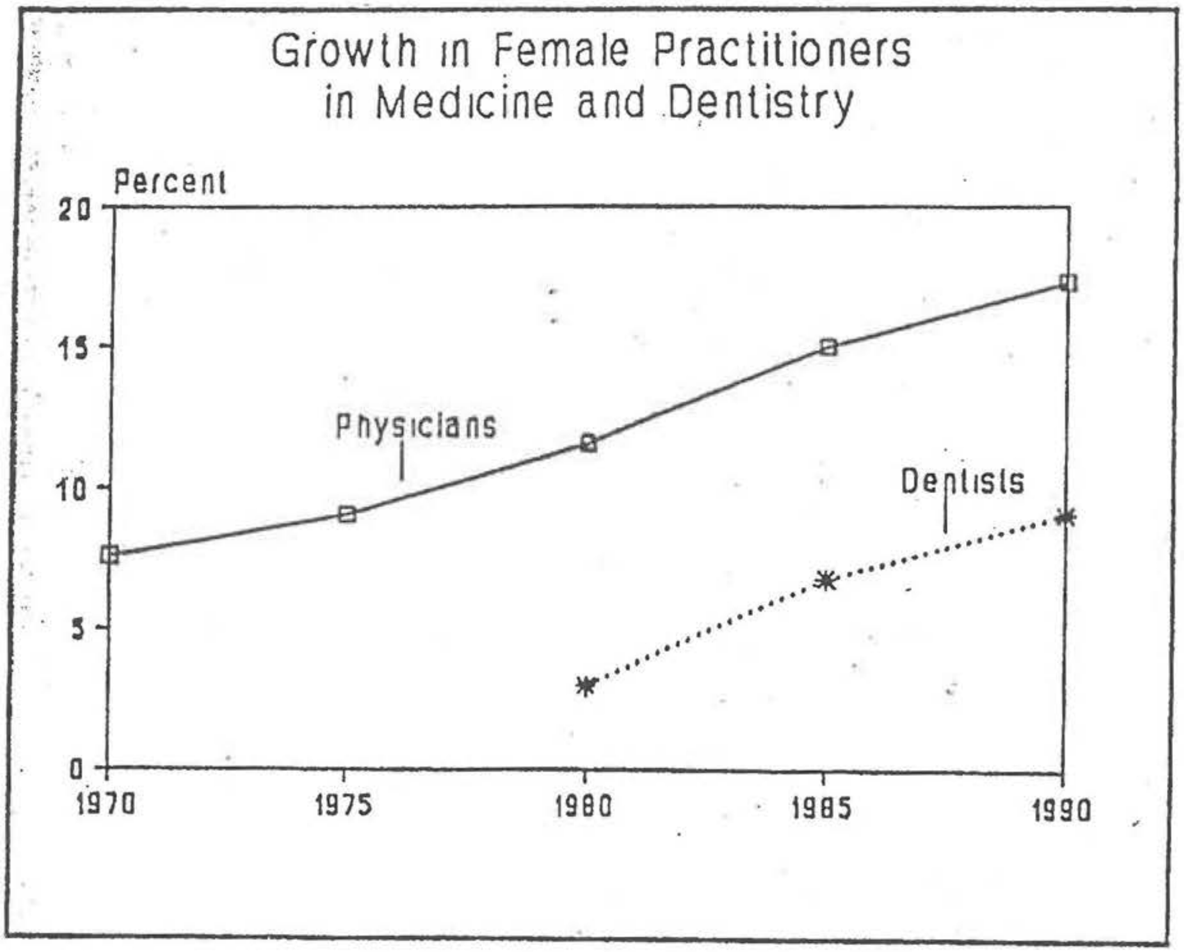

FIGURE 7: Total Enrollment In Optometry Schools, 1989-90 to 1992-93 (Taken from Association of Schools and Colleges of Optometry: Trends in Optometry Education. ASCO, 1994).

Ethnic Group	ACADEMIC YEAR 1989-90 #	%	1990-91 #	%	1991-92 #	%	1992-93 #	%	Average Annual Change
Black	132	2.8%	135	2.8%	141	2.9%	144	2.9%	2.9%
Hispanic	293	6.2%	295	6.2%	295	6.1%	314	6.3%	2.3%
Native American	21	0.4%	30	0.6%	31	0.6%	27	0.5%	8.7%
Total Underrepresented Minorities	446	9.4%	460	9.7%	467	9.6%	485	9.7%	2.8%
White	3649	77.3%	3577	75.1%	3570	73.4%	3604	72.1%	-0.4%
Asian	529	11.2%	594	12.5%	643	13.2%	698	14.0%	9.7%
Foreign National*	98	2.1%	131	2.8%	184	3.8%	211	4.2%	29.1%
TOTAL	4722	100.0%	4762	100.0%	4864	100.0%	4998	100.0%	1.9%

* Permanent Canadian residents make up the bulk of foreign national students.
The percent of foreign students who were permanent Canadian residents each year is as follows:
1989-90 (57%); 1990-91 (62%); 1991-92 (71%); 1992-93 (73%).

FIGURE 8: Total Enrollment in the Professial O.D. program, by racial/ethnic group, 1989-90 to 1992-93 (Taken from Association of Schools and Colleges of Optometry: Trends in Optometry Education. ASCO, 1994).

ENDNOTES

1 Sluchak TJ. Ergonomics: Origin, focus and implementation consideration. AAOHN Journal, 1992;40(3):105-112.

2 Christensen JM. Human factors definitions. Human Factors Society Bulletin, 1987;31(3):8-9.

3 Human Factors Society (1988). *Directory of Human Factors/Engineering Consultants*, Santa Monica, CA: Human Factors Society.

4 Human Factors Society (1991). *Directory of Human Factors Graduate Programs in the United States and Canada.* Santa Monica, CA: Human Factors Society.

5 Pearson RG. (Ed.) (1988) *International Directory of Educational Programs in Ergonomics/Human Factors.* Available from Human Factors Society, Santa Monica, CA

6 Budnick LD. Human factors in occupational medicine. JOM, 1993; 35(6):588-94.

7 Association of schools and colleges of optometry. Trends in optometry education. ASCO, 1994.

8 Brin BN, Voorhees LI, Hopping RL, et al. Men and women in optometry. 1 Economic issues and professional profiles. JAOA, 1995; 66(3):178-88.

9 Blue CL. Women in nontraditional jobs--is there a risk for musculoskeletal injury? AAOHN J 1993; 41(5):235-40.

APPENDIX

T-tests for male versus female data

Unpaired t-Test X_1: Gender Y_1: Height (cm)

DF:	Unpaired t Value:	Prob. (2-tail):
64	-9.457	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	163.327	6.302	1.097
M	33	179.827	7.794	1.357

Unpaired t-Test X_1: Gender Y_2: Far PD

DF:	Unpaired t Value:	Prob. (2-tail):
64	-3.954	.0002

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	60.197	2.44	.425
M	33	62.621	2.54	.442

Unpaired t-Test X_1: Gender Y_3: Near PD

DF:	Unpaired t Value:	Prob. (2-tail):
64	-2.874	.0055

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	56.576	2.382	.415
M	33	58.258	2.372	.413

Unpaired t-Test X_1: Gender Y_4: Head circum

DF:	Unpaired t Value:	Prob. (2-tail):
64	-6.283	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	55.582	1.289	.224
M	33	57.991	1.786	.311

T-tests for male versus female data

Unpaired t-Test X_1: Gender Y_5: Eye-floor

DF:	Unpaired t Value:	Prob. (2-tail):
64	-3.528	.0008

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	121.167	4.585	.798
M	33	126.485	7.346	1.279

Unpaired t-Test X_1: Gender Y_6: Foot-knee

DF:	Unpaired t Value:	Prob. (2-tail):
64	-6.602	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	50.142	2.334	.406
M	33	56.712	5.219	.908

Unpaired t-Test X_1: Gender Y_7: Palm-floor

DF:	Unpaired t Value:	Prob. (2-tail):
64	-5.7	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	77.5	5.551	.966
M	33	84.591	4.501	.783

Unpaired t-Test X_1: Gender Y_8: Harmon dx

DF:	Unpaired t Value:	Prob. (2-tail):
64	-9.051	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
F	33	34.461	1.756	.306
M	33	38.803	2.125	.37

T-tests for sit versus stand, all subjects

Unpaired t-Test X_1: Sit/stand Y_1: Height (cm)

DF:	Unpaired t Value:	Prob. (2-tail):
64	-5.983	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	163.55	8.882	1.742
sit	40	176.795	8.727	1.38

Unpaired t-Test X_1: Sit/stand Y_2: Far PD

DF:	Unpaired t Value:	Prob. (2-tail):
64	-1.064	.2911

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	60.962	2.615	.513
sit	40	61.7	2.839	.449

Unpaired t-Test X_1: Sit/stand Y_3: Near PD

DF:	Unpaired t Value:	Prob. (2-tail):
64	-.183	.8555

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	57.346	2.525	.495
sit	40	57.463	2.525	.399

Unpaired t-Test X_1: Sit/stand Y_4: Head circum

DF:	Unpaired t Value:	Prob. (2-tail):
64	-3.025	.0036

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	55.931	1.906	.374
sit	40	57.342	1.817	.287

T-tests for sit versus stand, all subjects

Unpaired t-Test X_1: Sit/stand Y_5: Eye-floor

DF:	Unpaired t Value:	Prob. (2-tail):
64	-4.431	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	119.865	4.356	.854
sit	40	126.4	6.639	1.05

Unpaired t-Test X_1: Sit/stand Y_6: Foot-knee

DF:	Unpaired t Value:	Prob. (2-tail):
64	-3.607	.0006

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	50.796	3.723	.73
sit	40	55.138	5.346	.845

Unpaired t-Test X_1: Sit/stand Y_7: Palm-floor

DF:	Unpaired t Value:	Prob. (2-tail):
64	-4.264	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	77.481	6.314	1.238
sit	40	83.363	4.862	.769

Unpaired t-Test X_1: Sit/stand Y_8: Harmon dx

DF:	Unpaired t Value:	Prob. (2-tail):
64	-5.621	.0001

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	34.565	2.371	.465
sit	40	37.975	2.431	.384

T-tests for sit versus stand, all subjects

Unpaired t-Test X_1: Sit/stand Y_1: Handspan

DF:	Unpaired t Value:	Prob. (2-tail):
64	-3.24	.0019

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	26	19.635	1.706	.335
sit	40	21.02	1.692	.267

T-tests for sit versus stand, women only

Unpaired t-Test X_1: Sit/stand Y_1: Height (cm)

DF:	Unpaired t Value:	Prob. (2-tail):
31	-3.467	.0016

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	160.848	6.279	1.37
sit	12	167.667	3.4	.982

Unpaired t-Test X_1: Sit/stand Y_2: Far PD

DF:	Unpaired t Value:	Prob. (2-tail):
31	.942	.3534

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	60.5	2.127	.464
sit	12	59.667	2.934	.847

Unpaired t-Test X_1: Sit/stand Y_3: Near PD

DF:	Unpaired t Value:	Prob. (2-tail):
31	1.537	.1344

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	57.048	2.247	.49
sit	12	55.75	2.482	.716

Unpaired t-Test X_1: Sit/stand Y_4: Head circum

DF:	Unpaired t Value:	Prob. (2-tail):
31	-1.133	.2659

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	55.39	1.121	.245
sit	12	55.917	1.535	.443

T-tests for sit versus stand, women only

Unpaired t-Test X_1: Sit/stand Y_5: Eye-floor

DF:	Unpaired t Value:	Prob. (2-tail):
31	-3.481	.0015

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	119.357	4.05	.884
sit	12	124.333	3.762	1.086

Unpaired t-Test X_1: Sit/stand Y_6: Foot-knee

DF:	Unpaired t Value:	Prob. (2-tail):
31	-2.778	.0092

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	49.367	2.134	.466
sit	12	51.5	2.1	.606

Unpaired t-Test X_1: Sit/stand Y_7: Palm-floor

DF:	Unpaired t Value:	Prob. (2-tail):
31	-1.786	.0839

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	76.238	6.17	1.346
sit	12	79.708	3.474	1.003

Unpaired t-Test X_1: Sit/stand Y_8: Harmon dx

DF:	Unpaired t Value:	Prob. (2-tail):
31	-3.138	.0037

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	33.819	1.54	.336
sit	12	35.583	1.578	.456

T-tests for sit versus stand, women only

Unpaired t-Test X_1: Sit/stand Y_9: Handspan

DF:	Unpaired t Value:	Prob. (2-tail):
31	-2.216	.0341

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	21	19.167	1.208	.264
sit	12	20.042	.838	.242

T-tests for sit versus stand, men only

Unpaired t-Test X_1: Sit/stand Y_1: Height (cm)

DF:	Unpaired t Value:	Prob. (2-tail):
31	-1.569	.1267

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	174.9	9.826	4.394
sit	28	180.707	7.239	1.368

Unpaired t-Test X_1: Sit/stand Y_2: Far PD

DF:	Unpaired t Value:	Prob. (2-tail):
31	.262	.7947

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	62.9	3.782	1.691
sit	28	62.571	2.348	.444

Unpaired t-Test X_1: Sit/stand Y_3: Near PD

DF:	Unpaired t Value:	Prob. (2-tail):
31	.346	.732

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	58.6	3.489	1.56
sit	28	58.196	2.2	.416

Unpaired t-Test X_1: Sit/stand Y_4: Head circum

DF:	Unpaired t Value:	Prob. (2-tail):
31	.28	.7813

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	58.2	2.907	1.3
sit	28	57.954	1.587	.3

T-tests for sit versus stand, men only

Unpaired t-Test X_1: Sit/stand Y_5: Eye-floor

DF:	Unpaired t Value:	Prob. (2-tail):
31	-1.512	.1408

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	122	5.431	2.429
sit	28	127.286	7.429	1.404

Unpaired t-Test X_1: Sit/stand Y_6: Foot-knee

DF:	Unpaired t Value:	Prob. (2-tail):
31	.04	.9682

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	56.8	2.842	1.271
sit	28	56.696	5.575	1.054

Unpaired t-Test X_1: Sit/stand Y_7: Palm-floor

DF:	Unpaired t Value:	Prob. (2-tail):
31	-1.021	.3154

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	82.7	4.087	1.828
sit	28	84.929	4.556	.861

Unpaired t-Test X_1: Sit/stand Y_8: Harmon dx

DF:	Unpaired t Value:	Prob. (2-tail):
31	-1.272	.2127

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	37.7	2.842	1.271
sit	28	39	1.972	.373

T-tests for sit versus stand, men only

Unpaired t-Test X_1: Sit/stand Y_9: Handspan

DF:	Unpaired t Value:	Prob. (2-tail):
31	.178	.8599

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
stand	5	21.6	2.219	.992
sit	28	21.439	1.8	.34

Descriptive statistics, all subjects

X_1: Height (cm)

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
171.577	10.889	1.34	118.568	6.346	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
151	200	49	11324.1	1950665.13	0

X_2: Far PD

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
61.409	2.757	.339	7.599	4.489	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
56	69	13	4053	249385	0

X_3: Near PD

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
57.417	2.506	.309	6.281	4.365	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
52	64.5	12.5	3789.5	217988.75	0

X_4: Head circum

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
56.786	1.965	.242	3.862	3.461	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
52.5	61.5	9	3747.9	213080.63	0

X_5: Eye-floor

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
123.826	6.64	.817	44.096	5.363	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
113	157	44	8172.5	1014832.25	0

Descriptive statistics, all subjects

X_6: Foot-knee

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
53.427	5.201	.64	27.046	9.734	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
45	81	36	3526.2	190153.24	0

X_7: Palm-floor

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
81.045	6.157	.758	37.906	7.597	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
58	97	39	5349	435976	0

X_8: Harmon dx

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
36.632	2.92	.359	8.527	7.971	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
31	44	13	2417.7	89118.97	0

X_9: Handspan

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
20.474	1.817	.224	3.302	8.876	66
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
14.5	25	10.5	1351.3	27881.49	0

Descriptive statistics, women only

X_1: Height (cm)

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
163.327	6.302	1.097	39.71	3.858	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
151	175	24	5389.8	881572.04	33

X_2: Far PD

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
60.197	2.44	.425	5.952	4.053	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
56	66	10	1986.5	119771.75	33

X_3: Near PD

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
56.576	2.382	.415	5.674	4.21	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
52	61	9	1867	105808.5	33

X_4: Head circum

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
55.582	1.289	.224	1.662	2.319	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
52.5	58	5.5	1834.2	102001.34	33

X_5: Eye-floor

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
121.167	4.585	.798	21.026	3.784	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
113	130	17	3998.5	485157.75	33

Descriptive statistics, women only

X_6: Foot-knee

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
50.142	2.334	.406	5.448	4.655	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
45	55.5	10.5	1654.7	83144.99	33

X_7: Palm-floor

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
77.5	5.551	.966	30.812	7.162	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
58	87.5	29.5	2557.5	199192.25	33

X_8: Harmon dx

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
34.461	1.756	.306	3.082	5.094	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
31	38	7	1137.2	39287.22	33

X_9: Handspan

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
19.485	1.156	.201	1.336	5.931	33
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum of Sqr.:**	**# Missing:**
16.5	22	5.5	643	12571.5	33

Histograms, all subjects

X_1: Height (cm)

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	151	156	4	6.061%	
2	156	161	7	10.606%	
3	161	166	8	12.121%	
4	166	171	17	25.758%	-Mode
5	171	176	8	12.121%	
6	176	181	8	12.121%	
7	181	186	6	9.091%	
8	186	191	6	9.091%	
9	191	196	0	0%	
10	196	201	2	3.03%	

X_2: Far PD

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	56	57.4	3	4.545%	
2	57.4	58.8	8	12.121%	
3	58.8	60.2	17	25.758%	-Mode
4	60.2	61.6	10	15.152%	
5	61.6	63	5	7.576%	
6	63	64.4	12	18.182%	
7	64.4	65.8	7	10.606%	
8	65.8	67.2	3	4.545%	
9	67.2	68.6	0	0%	
10	68.6	70	1	1.515%	

Histograms, all subjects

X_3: Near PD

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	52	53.35	2	3.03%	
2	53.35	54.7	5	7.576%	
3	54.7	56.05	21	31.818%	-Mode
4	56.05	57.4	7	10.606%	
5	57.4	58.75	10	15.152%	
6	58.75	60.1	12	18.182%	
7	60.1	61.45	6	9.091%	
8	61.45	62.8	1	1.515%	
9	62.8	64.15	1	1.515%	
10	64.15	65.5	1	1.515%	

X_4: Head circum

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	52.5	53.41	2	3.03%	
2	53.41	54.32	2	3.03%	
3	54.32	55.23	14	21.212%	-Mode
4	55.23	56.14	13	19.697%	
5	56.14	57.05	10	15.152%	
6	57.05	57.96	5	7.576%	
7	57.96	58.87	10	15.152%	
8	58.87	59.78	4	6.061%	
9	59.78	60.69	4	6.061%	
10	60.69	61.6	2	3.03%	

Histograms, all subjects

X_5: Eye-floor

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	113	117.5	10	15.152%	
2	117.5	122	11	16.667%	
3	122	126.5	26	39.394%	-Mode
4	126.5	131	13	19.697%	
5	131	135.5	4	6.061%	
6	135.5	140	1	1.515%	
7	140	144.5	0	0%	
8	144.5	149	0	0%	
9	149	153.5	0	0%	
10	153.5	158	1	1.515%	

X_6: Foot-knee

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	45	48.7	8	12.121%	
2	48.7	52.4	24	36.364%	-Mode
3	52.4	56.1	15	22.727%	
4	56.1	59.8	17	25.758%	
5	59.8	63.5	0	0%	
6	63.5	67.2	1	1.515%	
7	67.2	70.9	0	0%	
8	70.9	74.6	0	0%	
9	74.6	78.3	0	0%	
10	78.3	82	1	1.515%	

Histograms, all subjects

X_7: Palm-floor

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	58	62	1	1.515%	
2	62	66	0	0%	
3	66	70	1	1.515%	
4	70	74	3	4.545%	
5	74	78	14	21.212%	
6	78	82	18	27.273%	-Mode
7	82	86	15	22.727%	
8	86	90	12	18.182%	
9	90	94	1	1.515%	
10	94	98	1	1.515%	

X_8: Harmon dx

Bar:	From: (≥)	To: (<)	Count:	Percent:
1	31	32.4	3	4.545%
2	32.4	33.8	10	15.152%
3	33.8	35.2	12	18.182%
4	35.2	36.6	7	10.606%
5	36.6	38	8	12.121%
6	38	39.4	12	18.182%
7	39.4	40.8	10	15.152%
8	40.8	42.2	2	3.03%
9	42.2	43.6	1	1.515%
10	43.6	45	1	1.515%

Histograms, all subjects

Xg: Handspan

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	14.5	15.65	1	1.515%	
2	15.65	16.8	1	1.515%	
3	16.8	17.95	2	3.03%	
4	17.95	19.1	10	15.152%	
5	19.1	20.25	19	28.788%	-Mode
6	20.25	21.4	12	18.182%	
7	21.4	22.55	15	22.727%	
8	22.55	23.7	4	6.061%	
9	23.7	24.85	1	1.515%	
10	24.85	26	1	1.515%	

Histograms, women only

X_1: Height (cm)

Bar:	From: (≥)	To: (<)	Count:	Percent:
1	151	153.5	3	9.091%
2	153.5	156	1	3.03%
3	156	158.5	4	12.121%
4	158.5	161	3	9.091%
5	161	163.5	2	6.061%
6	163.5	166	6	18.182%
7	166	168.5	6	18.182%
8	168.5	171	6	18.182%
9	171	173.5	0	0%
10	173.5	176	2	6.061%

X_2: Far PD

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	56	57.1	3	9.091%	
2	57.1	58.2	6	18.182%	
3	58.2	59.3	4	12.121%	
4	59.3	60.4	7	21.212%	-Mode
5	60.4	61.5	3	9.091%	
6	61.5	62.6	4	12.121%	
7	62.6	63.7	5	15.152%	
8	63.7	64.8	0	0%	
9	64.8	65.9	0	0%	
10	65.9	67	1	3.03%	

Histograms, women only

X_3: Near PD

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	52	52.91	1	3.03%	
2	52.91	53.82	3	9.091%	
3	53.82	54.73	3	9.091%	
4	54.73	55.64	3	9.091%	
5	55.64	56.55	10	30.303%	-Mode
6	56.55	57.46	1	3.03%	
7	57.46	58.37	3	9.091%	
8	58.37	59.28	4	12.121%	
9	59.28	60.19	3	9.091%	
10	60.19	61.1	2	6.061%	

X_4: Head circum

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	52.5	53.06	2	6.061%	
2	53.06	53.62	1	3.03%	
3	53.62	54.18	1	3.03%	
4	54.18	54.74	4	12.121%	
5	54.74	55.3	6	18.182%	
6	55.3	55.86	1	3.03%	
7	55.86	56.42	10	30.303%	-Mode
8	56.42	56.98	1	3.03%	
9	56.98	57.54	6	18.182%	
10	57.54	58.1	1	3.03%	

Histograms, women only

X_5: Eye-floor

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	113	114.8	5	15.152%	
2	114.8	116.6	2	6.061%	
3	116.6	118.4	1	3.03%	
4	118.4	120.2	4	12.121%	
5	120.2	122	4	12.121%	
6	122	123.8	9	27.273%	-Mode
7	123.8	125.6	1	3.03%	
8	125.6	127.4	4	12.121%	
9	127.4	129.2	2	6.061%	
10	129.2	131	1	3.03%	

X_6: Foot-knee

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	45	46.15	2	6.061%	
2	46.15	47.3	1	3.03%	
3	47.3	48.45	4	12.121%	
4	48.45	49.6	5	15.152%	
5	49.6	50.75	7	21.212%	
6	50.75	51.9	8	24.242%	-Mode
7	51.9	53.05	4	12.121%	
8	53.05	54.2	0	0%	
9	54.2	55.35	1	3.03%	
10	55.35	56.5	1	3.03%	

Histograms, women only

X_7: Palm-floor

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	58	61.05	1	3.03%	
2	61.05	64.1	0	0%	
3	64.1	67.15	0	0%	
4	67.15	70.2	1	3.03%	
5	70.2	73.25	2	6.061%	
6	73.25	76.3	10	30.303%	-Mode
7	76.3	79.35	7	21.212%	
8	79.35	82.4	6	18.182%	
9	82.4	85.45	4	12.121%	
10	85.45	88.5	2	6.061%	

X_8: Harmon dx

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	31	31.71	2	6.061%	
2	31.71	32.42	1	3.03%	
3	32.42	33.13	5	15.152%	
4	33.13	33.84	4	12.121%	
5	33.84	34.55	6	18.182%	-Mode
6	34.55	35.26	5	15.152%	
7	35.26	35.97	3	9.091%	
8	35.97	36.68	3	9.091%	
9	36.68	37.39	1	3.03%	
10	37.39	38.1	3	9.091%	

Histograms, women only

X9: Handspan

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	16.5	17.06	1	3.03%	
2	17.06	17.62	2	6.061%	
3	17.62	18.18	1	3.03%	
4	18.18	18.74	4	12.121%	
5	18.74	19.3	4	12.121%	
6	19.3	19.86	6	18.182%	
7	19.86	20.42	9	27.273%	-Mode
8	20.42	20.98	1	3.03%	
9	20.98	21.54	4	12.121%	
10	21.54	22.1	1	3.03%	

Histograms men only

X_1: Height (cm)

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	166.5	169.95	2	6.061%	
2	169.95	173.4	4	12.121%	
3	173.4	176.85	6	18.182%	
4	176.85	180.3	6	18.182%	
5	180.3	183.75	4	12.121%	
6	183.75	187.2	8	24.242%	-Mode
7	187.2	190.65	1	3.03%	
8	190.65	194.1	0	0%	
9	194.1	197.55	1	3.03%	
10	197.55	201	1	3.03%	

X_2: Far PD

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	58	59.2	2	6.061%	
2	59.2	60.4	6	18.182%	
3	60.4	61.6	7	21.212%	
4	61.6	62.8	1	3.03%	
5	62.8	64	4	12.121%	
6	64	65.2	8	24.242%	-Mode
7	65.2	66.4	4	12.121%	
8	66.4	67.6	0	0%	
9	67.6	68.8	0	0%	
10	68.8	70	1	3.03%	

Histograms men only

X3: Near PD

Bar:	From: (≥)	To: (<)	Count:	Percent:
1	55	55.96	4	12.121%
2	55.96	56.92	7	21.212%
3	56.92	57.88	3	9.091%
4	57.88	58.84	7	21.212%
5	58.84	59.8	4	12.121%
6	59.8	60.76	3	9.091%
7	60.76	61.72	2	6.061%
8	61.72	62.68	1	3.03%
9	62.68	63.64	1	3.03%
10	63.64	64.6	1	3.03%

X4: Head circum

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	55	55.66	5	15.152%	
2	55.66	56.32	1	3.03%	
3	56.32	56.98	0	0%	
4	56.98	57.64	8	24.242%	-Mode
5	57.64	58.3	5	15.152%	
6	58.3	58.96	4	12.121%	
7	58.96	59.62	4	12.121%	
8	59.62	60.28	2	6.061%	
9	60.28	60.94	2	6.061%	
10	60.94	61.6	2	6.061%	

Histograms men only

X_5: Eye-floor

Bar:	From: (≥)	To: (<)	Count:	Percent:
1	115	119.3	4	12.121%
2	119.3	123.6	5	15.152%
3	123.6	127.9	11	33.333%
4	127.9	132.2	11	33.333%
5	132.2	136.5	0	0%
6	136.5	140.8	1	3.03%
7	140.8	145.1	0	0%
8	145.1	149.4	0	0%
9	149.4	153.7	0	0%
10	153.7	158	1	3.03%

X_6: Foot-knee

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	50	53.2	8	24.242%	
2	53.2	56.4	6	18.182%	
3	56.4	59.6	17	51.515%	-Mode
4	59.6	62.8	0	0%	
5	62.8	66	1	3.03%	
6	66	69.2	0	0%	
7	69.2	72.4	0	0%	
8	72.4	75.6	0	0%	
9	75.6	78.8	0	0%	
10	78.8	82	1	3.03%	

Histograms men only

X7: Palm-floor

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	77	79.1	4	12.121%	
2	79.1	81.2	6	18.182%	
3	81.2	83.3	3	9.091%	
4	83.3	85.4	7	21.212%	
5	85.4	87.5	3	9.091%	
6	87.5	89.6	8	24.242%	-Mode
7	89.6	91.7	0	0%	
8	91.7	93.8	1	3.03%	
9	93.8	95.9	0	0%	
10	95.9	98	1	3.03%	

X8: Harmon dx

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	33.5	34.65	2	6.061%	
2	34.65	35.8	0	0%	
3	35.8	36.95	1	3.03%	
4	36.95	38.1	9	27.273%	
5	38.1	39.25	7	21.212%	
6	39.25	40.4	10	30.303%	-Mode
7	40.4	41.55	2	6.061%	
8	41.55	42.7	0	0%	
9	42.7	43.85	1	3.03%	
10	43.85	45	1	3.03%	

Histograms men only

X9: Handspan

Bar:	From: (≥)	To: (<)	Count:	Percent:	
1	14.5	15.65	1	3.03%	
2	15.65	16.8	0	0%	
3	16.8	17.95	0	0%	
4	17.95	19.1	1	3.03%	
5	19.1	20.25	4	12.121%	
6	20.25	21.4	7	21.212%	
7	21.4	22.55	14	42.424%	-Mode
8	22.55	23.7	4	12.121%	
9	23.7	24.85	1	3.03%	
10	24.85	26	1	3.03%	