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Optometric trends in sports vision: Knowledge, utilization, and practitioner role expansion potential

Abstract

The goal of this project was to generate both longitudinal and current cross-sectional data relevant to the following topics: (1) Determination of the involvement of O.D.'s in the sub-discipline of sports vision, (2) utilization of vision care services by college and professional sports programs, and (3) determination of the interest of optometrists and sports program personnel in sports vision care. In 1980 and 1983, unpublished surveys were conducted which sampled random optometrists, various college and university athletic programs, and the major professional teams of football, baseball, basketball, and hockey in North America. This 1987-88 survey was an extension of the past two surveys. It compared trends longitudinally and assessed the interest in sports vision as an optometric specialty area. Despite increased involvement during the last five years, results indicate that there continues to be an unmet need for sports vision consultants to teams, particularly among smaller colleges. A large percentage of optometrists continue to feel there is great potential for growth in sports vision. Utilization of contact lenses by teams and individual athletes has increased markedly over the last five years while only a slight increase has been observed in the utilization of vision training programs.

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OPTOMETRIC TRENDS IN SPORTS VISION:
KNOWLEDGE, UTILIZATION, AND PRACTITIONER
ROLE EXPANSION POTENTIAL

A Thesis Presented to the Faculty of Pacific University By

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In Partial Fulfillment of the Degree Doctor of Optometry

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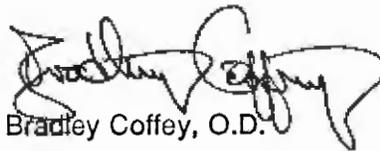
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ABSTRACT

The goal of this project was to generate both longitudinal and current cross-sectional data relevant to the following topics: (1) Determination of the involvement of O.D.'s in the sub-discipline of sports vision, (2) utilization of vision care services by college and professional sports programs, and (3) determination of the interest of optometrists and sports program personnel in sports vision care. In 1980 and 1983, unpublished surveys were conducted which sampled random optometrists, various college and university athletic programs, and the major professional teams of football, baseball, basketball, and hockey in North America. This 1987-88 survey was an extension of the past two surveys. It compared trends longitudinally and assessed the interest in sports vision as an optometric specialty area. Despite increased involvement during the last five years, results indicate that there continues to be an unmet need for sports vision consultants to teams, particularly among smaller colleges. A large percentage of optometrists continue to feel there is great potential for growth in sports vision. Utilization of contact lenses by teams and individual athletes has increased markedly over the last five years while only a slight increase has been observed in the utilization of vision training programs.

KEY WORDS

athletic eyewear, contact lenses, optometric trends, vision training,

Introduction

The optometric discipline of sports vision is a relatively young and actively growing area of optometry which has spurred the interest of optometrists and sports organizations at high school, college, and professional levels. Since the establishment of the AOA Sports Vision Section (SVS) eleven years ago, advances have been made in the utilization and acceptance of sports vision, although greater awareness is necessary for both the public and practicing optometrists to recognize the full scope of sports vision services. Keen public interest in the area is evidenced by the frequency of sports vision related topics appearing in the media. The lack of awareness among athletes regarding sports vision and vision care in general is exemplified by many elite athletes who indicate they have never had a complete vision exam. Case histories completed by athletes evaluated by members of the AOA SVS during the 1985 National Sports Festival in Baton Rouge, Louisiana, indicated that 55% of the athletes participating in the evaluation never had a complete vision exam. Of the 347 athletes participating in the AOA SVS Vision Evaluation for the 1986 U.S. Olympic Festival (formerly National Sports Festival) in Houston, Texas, 173 (50%) had never received a complete visual examination.¹ Information collected by Reichow during vision evaluation of a National Football League team in 1984 indicated that 48% of the rookies and 29% of the team veterans had no prior vision exam.¹ These data indicate the unmet need for even the most basic vision care services in the athletic community.

In 1980 and 1983, unpublished surveys were conducted by Pacific University College of Optometry which sampled random optometrists, various college and university athletic programs, and the major professional teams of football, baseball, basketball, and hockey in North America.^{2,3} These surveys were designed to measure specific attitudes of optometrists and sports program personnel about vision care and sports vision in particular. Results of these past two studies are summarized below. Although the previous surveys were based on relatively small sample sizes, there were several

interesting inferences drawn from the data. The outcome of the 1980 study indicated there were opportunities available in both high schools and colleges for vision consultants. None of the O.D.'s surveyed were serving as consultants to professional teams. The unmet need within athletic programs was readily demonstrated since only a small percentage of college and professional teams utilized the services of a vision consultant in 1980, although in the same survey a large percentage (85%) of optometrists expressed interest and felt there was a great potential for growth in sports vision. Large colleges and professional teams were more likely to have vision care specialists on their payroll while small colleges and high schools received services on a voluntary basis. Optometrists definitely advocated the use of contact lenses over spectacles, particularly in those sports with a great deal of bodily contact. College and professional teams collectively reported that 1-4% of their athletes failed vision screenings (this rate was quite low relative to other studies which indicated that the failure rate for college athletic screenings was 20-30%).^{4,5,6} Sports program personnel did not consistently recommend contact lenses to their players, although many teams reported that their players were using contact lenses. In the 1980 study, few optometrists recommended or utilized vision therapy.

Responses of optometrists changed little from 1980 to 1983 in most categories surveyed. The number of optometrists consulting to athletic programs increased slightly, although the number compensated for their services remained unchanged. Optometrists once again felt there was a great potential for growth in sports vision. More optometrists (an increase from 25% to 39%) included vision training for athletes in their practices in 1983 than in 1980.

Although optometric respondents reported no change and no change was seen at the university level, increases were seen in the number of professional teams utilizing vision care consultants and the number of vision care specialists compensated. Fewer professional teams recommended contact lenses for their athletes between the 1980 and 1983 studies. These teams indicated that contact lens irritation and loss were the most frequently cited problems in both the 1980 and 1983 survey subsets.

The present study expands and continues the 1980 and 1983 surveys and once again probes the sample groups to assess the current trends in both the optometric and athletic communities.

Method

The research for this project was conducted through a postal survey. Surveys were sent to randomly selected optometrists throughout the United States. Two separate groups of optometrists were surveyed, the first group served as the longitudinal subset and consisted of the same 100 optometrists (two optometrists from each state) sampled in the 1983 survey. These optometrists were originally chosen at random from the *Blue Book of Optometry*.⁷ Since this was relatively small an additional sample of optometrists was added to the current study. The second subset (373 optometrists) served as the cross-sectional subset and was also chosen randomly from the *Blue Book of Optometry* in proportion to the density of optometrists in each state.

The questions asked of optometrists dealt with specific issues such as the potential for growth in the field of sports vision, practitioner utilization of contact lenses versus spectacles for athletes, and utilization of vision training or enhancement procedures for athletes. The questionnaire also addressed more specific areas in contact lens application such as the preference of soft versus hard lenses, whether the optometrist advocated the use of extended wear lenses for athletes, whether they promoted the use of protective and/or corrective athletic eyewear, and whether their facility included a dispensary where protective eyewear was available to athletes. A cover letter introducing the researchers and defining the survey objectives accompanied the questionnaire. A copy of the optometrist questionnaire is included in appendix A.

A separate questionnaire was sent to the intercollegiate sports programs at various colleges and universities throughout the United States, and to all the major North American professional teams of baseball, football, basketball, and hockey. The same 80 universities surveyed in 1983 were again questioned and served as the longitudinal subset. Additional samples of all 105 NCAA Division IA schools and 105

random Division III schools were contacted. Division IA institutions characteristically have large student bodies and offer athletic scholarships whereas Division III schools are typically smaller and do not offer athletic scholarships. Since many universities and some professional programs were on summer break and some professional programs were off-season, during the initial survey, the response rate from university and professional teams was relatively small. As a result, the non-responding programs were again polled with the same survey approximately six months later.

All major professional sports teams were contacted in either or both the 1980 and 1983 surveys (USFL and NHL in 1983 only). The 98 surveys sent to professional sports teams in the current study were distributed as follows: Baseball, 26 teams; basketball, 23 teams; football, 28 teams; and hockey, 21 teams. The questionnaires were directed to the teams' athletic trainers since they are generally more familiar with team-related health-care issues.

Questionnaires sent to university and professional teams addressed such issues as team utilization of optometrists and/or ophthalmologists, utilization of sports vision training programs, proportion of athletes wearing contact lenses versus spectacles, and future interest in the area of sports vision. Special consideration was given to the utilization of contact lenses. A cover letter similar to that sent with the optometrist survey was attached to the athletic team questionnaire. A copy of the sports team questionnaire can be found in appendix A.

Results

The survey data have been presented in tabular form for ease of comparison. The tables section the longitudinal and cross-sectional optometric, collegiate, and professional survey data into the various subsets.

Optometry

Optometrists surveyed in the past studies indicated there were more opportunities available for consulting positions in the high school and collegiate ranks

than among professional teams, probably due to the limited number of major professional programs in North America. The 1987-88 survey results parallel the prior study results quite closely in this regard. In the previous surveys it was found that most optometrists volunteered their services. The 1987-88 longitudinal data showed a greater percentage of optometrists being paid for their services than was found in previous surveys. Most optometrists continue to feel there is a great potential for growth in the area of sports vision. Similarly, a high percentage of optometrists continue to consider athletes separately in their practices.

Table 1: Optometric Longitudinal Data

	1987-88	1983	1980
100 Optometrists Surveyed	49% response	51% response	64% response
Optometrists consulting to athletic teams at the high school, collegiate, and/or professional level.	14% [7 of 49]	16% [8 of 51]	9% [6 of 64]
O.D.'s paid vs. volunteering services.	5 of 7 were paid 2 of 7 volunteer	1 of 8 was paid 4 of 8 volunteer 3 not specified	2 of 6 were paid 4 of 6 volunteer
Optometrists indicating a potential for growth in the area of sports vision.	90% [44 of 49]	90% [46 of 51]	85% [54 of 64]
Optometrists considering the specific visual demands of the athlete separately when prescribing lenses.	80% [39 of 49]	65% [33 of 51]	75% [46 of 61]
Optometrists preferring contact lenses over spectacles for athletes.	94% [45 of 48]	84% [43 of 51]	93% [59 of 64]
Optometrists preferring soft contact lenses, rigid lenses, or no preference.	85% soft 5% rigid 10% no pref.	N.A.	N.A.
Optometrists advocating the use of extended wear contact lenses.	21% [9 of 42]	N.A.	N.A.
Optometrists including vision training in their practice for athletes.	46% [22 of 48]	39% [20 of 51]	25% [16 of 64]
Vision training techniques utilized:	[2 not specified]	[7 not specified]	
Vision enhancement	[9 of 20, 45%]	[4 of 13, 31%]	
Remedial training	[3 of 20, 15%]	[2 of 13, 15%]	
Combination of both techniques	[8 of 20, 40%]	[7 of 13, 54%]	
Optometrists advocating the use of athletic eyewear for the athletes.	90% [43 of 48]	N.A.	N.A.
Optometrists including athletic eyewear in their dispensary.	87% [40 of 46]	N.A.	N.A.

N.A.: Denotes information was not available for specific survey subset.

Table 2: Optometric Cross-Sectional Data

373 Optometrists Surveyed	40% response	
Optometrists consulting to athletic teams at the high school, collegiate, and/or professional level.	9% [14 of 149]	high school-college-professional 3, O.D.'s 5, O.D.'s 0, O.D.'s 3 O.D.'s not specifying 2 O.D.'s consult to college and H.S.
O.D.'s paid vs. volunteering services.	23% paid 3 of 13 were paid	10 of 13 volunteered 1 not specified
Optometrists indicating a potential for growth in the area of sports vision.	93% [128 of 138]	
Optometrists considering the specific visual demands of athletes separately when prescribing lenses.	79% [112 of 142]	
Optometrists preferring contact lenses over spectacles for athletes.	92% [134 of 145]	soft vs. rigid lenses 62% soft/13% rigid/25% N.A.
Optometrists advocating the use of extended wear contact lenses.	21% [26 of 124]	
Optometrists including vision training in their practice for athletes.	41% [60 of 147]	visual enhancement-13 [29%] remedial training-18 [40%] both techniques-14 [31%]
Optometrists advocating the use of athletic eyewear for the athletes.	85% [124 of 146]	
Optometrists including athletic eyewear in their dispensary.	82% [113 of 138]	

Optometrists continue to favor the use of contact lenses for athletes as shown by the ninety-four percent who indicated this preference over spectacles. The majority (85%) of optometrists surveyed preferred soft contact lenses over rigid lenses (5%) while 10% specified no preference. A small percentage of optometrists, 21% (9 of 42) advocated the use of extended wear contact lenses for athletes.

The survey also indicated that approximately 46% of the responding optometrists utilized vision training in their practices. These results are similar to those of the 1983 survey, while results from the 1980 survey were considerably lower (25%). Optometrists indicated that visual enhancement training, and a combination of both visual enhancement and remedial training, were used approximately equally in their practice settings, while remedial training only was utilized less frequently. Most optometrists (90%) advocated the use of athletic eyewear for athletes while slightly fewer (87%) actually dispensed athletic eyewear in their practices.

With only a few exceptions, relatively little difference was noted between the 1987-88 longitudinal and cross-sectional surveys. Cross-sectional data revealed a lower percentage of optometrists consulting to teams and a greater percentage of optometrists volunteering their services. Fewer optometrists preferred soft contact lenses over rigid lenses in the cross-sectional subset than in the longitudinal subset.

College/University

Two identical surveys were sent to college and professional teams at separate dates to increase the sample size of those subsets (first survey June 20, 1987; second survey January, 14, 1988). Follow-up surveys were sent only to programs which failed to respond to the first survey. College and professional subsets were the only groups for which this approach was taken and neither the 1980 nor 1983 surveys used resampling. As a result, a much higher response rate was attained for both the university and professional subsets than in previous surveys. The initial mailing response rate for the 1987-88 longitudinal college data was 39% (31 of 80). This

compares to 26% (21 of 80) in 1983 and 36% (27 of 75) in 1980. The total response rate in 1987-88 with resampling was 61%.

The results of the college/university longitudinal sampling indicated that several major changes have occurred since the 1983 survey. The data suggest that more college teams are utilizing vision care specialists and that a greater number of these consultants are being paid for their services. Despite this increased involvement, the number of teams utilizing vision screening programs remained unchanged.

Table 3: College/University Longitudinal Data

	1987-88	1983	1980
Total response rate of colleges and universities surveyed.	61% response [49 of 80]	26% response [21 of 80]	36% response [27 of 75]
Vision care specialists affiliated with college athletic programs.	65% [32 of 49]	26% [7 of 27]	24% [5 of 21]
Vision consultants paid vs. volunteering their services .	50% paid [16 of 32]	14% paid [1 of 7]	20% paid [1 of 5]
Degree of vision consultant: (optometrist, ophthalmologist, or both) (% may not equal 100% due to shared use of O.D.'s and M.D.'s by some teams.)	78% O.D. 34 % M.D. [21 of 32, O.D.] [7 of 32, M.D.] 4 teams used both	71% O.D. [5 of 7, O.D.]	100% O.D. 20% M.D. [4 of 5, O.D.] 1 team used both
Teams using a vision screening program.	59% [29 of 49]	57% [12 of 21]	N.A.
Mean of athletes failing vision screenings.	15%	4.5%	N.A.
Range of responses for failing screenings.	0% - 33%	0% - 30%	0% - 15%
Recommendation of contact lenses over spectacles for athletes.	83% [40 of 48]	67% [14 of 21]	N.A.
Percentage of players requiring visual correction utilizing contact lenses.	53%	42%	N.A.
Ratio breakdown of soft lens wearers to the total of all rigid & soft lens wearers.			
100-76% soft	32	21	11
75-51% soft	6	2	3
50-26% soft	1	0	1
25-0% soft	0	0	0
Athletes most frequent problems with contact lenses.	irritation & loss	irritation & loss	irritation & loss
Teams keeping extra contact lenses available in case of loss or damage.	60% [28 of 47]	43% [9 of 21]	36% [8 of 22]
Teams with someone available to remove a contact lens from an injured athlete.	90% [43 of 48]	76% [16 of 21]	86%
Athletic teams utilizing visual training.	23% [11 of 49]	24% [5 of 21]	approx. 5%
Vision training technique utilized:			
Vision enhancement	6 not specified [2 of 5, 40%]	[3 of 5, 60%]	N.A.
Remedial training	[1 of 5, 20%]	[0 of 5, 0%]	
Combination of both techniques	[2 of 5, 40%]	[2 of 5, 40%]	
Team and/or player improvements associated with vision training.	70% [7 of 10]	80% [4 of 5]	N.A.

N.A.: Denotes information was not available for study subset.

Table 4: College/University Cross-Sectional Data

	Division III	Division IA
Total response rate of colleges and universities surveyed.	46% [48 of 105]	68% [71 of 105]
Vision care specialists affiliated with college athletic programs.	8% [4 of 48]	86% [61 of 71]
Vision consultants paid vs. volunteering their services .	50% were paid [2 of 4]	45 % were paid [32 of 71]
Degree of vision consultant: (optometrist, ophthalmologist, or both). (% may not equal 100% due to shared use of O.D.'s and M.D.'s by some teams.)	50% O.D. 50% M.D. [2 of 4, O.D.] [2 of 4, M.D.]	70% O.D. 63% M.D. [23 of 63, O.D.] [19 of 63, M.D.] [21 of 63, both]
Teams using a vision screening program.	8% [4 of 47]	61% [43 of 71]
Mean of athletes failing vision screenings.	0% failure	10% failure
Range of responses for failing screenings.	0%	0%-33%
Recommendation of contact lenses over spectacles for athletes.	61% C.L.'s [23 of 38]	94% C.L.'s [65 of 69]
Percentage of players requiring visual correction utilizing contact lenses.	50%	53%
Ratio breakdown of soft lens wearers to the total of all rigid & soft lens wearers. 100-76% soft 75-51% soft 50-26% soft 25-0% soft	21 3 1 0	57 6 0 0
Contact lens problems most often reported by college athletes.	irritation & loss	irritation & loss
Teams keeping extra contact lenses available in case of loss or damage.	10% [5 of 48]	68% [48 of 71]
Teams with someone available to remove a contact lens from an injured athlete.	83% [40 of 48]	99% [69 of 70]
Athletic teams utilizing visual training.	2% [1 of 46]	24% [17 of 70]
Vision training technique utilized: Vision enhancement Remedial training Combination of both techniques	[1 of 1, 100%]	[9 of 14, 64%] [2 of 14, 14%] [3 of 14, 21%]
Team and/or player improvements associated with vision training.	100% [1 of 1]	94% [15 of 16]

An increased percentage of universities recommended contact lenses over spectacles for athletes, and soft contact lenses were once again preferred over rigid lenses. Problems most often noted were lens irritation and loss. Teams keeping extra contact lenses available in case of loss or damage increased since the 1983 study, and more teams reported trained personnel available to remove a contact lens from a player.

An increase in vision training program utilization was seen between 1980 and 1983, although little change has occurred between the 1983 and 1987-88 studies. Among colleges utilizing vision training, visual enhancement training or a combination of visual enhancement and remedial training programs are slightly more common than remedial training programs alone. Among teams utilizing vision training programs, 70% (7 of 10) noted associated team and/or individual player improvements in performance.

The cross-sectional sample consisted of NCAA Division IA and Division III institutions. Many contrasts were noted between these two subsets which may have resulted from differences between divisions in terms of college student body sizes, scholarship fund availability, and/or general university budget limitations. Division IA teams utilized vision care specialists more frequently by a ratio of greater than 10 to 1. More Division IA teams are utilizing the services of an optometrist versus an ophthalmologist. By a ratio of 7 to 1, Division IA teams included more screening programs as a service to their athletes than Division III teams.

As with the longitudinal data the large majority of teams recommended contact lenses over spectacles for their athletes, with more Division IA teams (64 of 69, 94%) recommending contact lenses than Division III teams (23 of 38, 61%). As past surveys have shown, the majority of contact lens wearing athletes utilize soft lenses. The most common contact lens problems experienced by these athletes were irritation and loss. These complaints have been listed as the most frequent problems in each study subset. Other problems cited include glare, wind, and dust.

A large difference was noted between Division IA and Division III teams with regard to maintaining a spare set of contact lenses. Division IA programs provide this service seven times more frequently than Division III programs. Nearly all Division IA

teams (99%) and most Division III teams (83%) indicated there was a person knowledgeable in emergency contact lens removal.

Division III teams indicated a very low rate of vision training utilization (1 of 46, 2%) while Division IA teams indicated a utilization rate of 24% (17 of 70) which was similar to the 1987-88 longitudinal data. Of the 16 Division IA teams incorporating vision training, 15 indicated team and/or individual player improvements resulting from such efforts.

Professional Teams

The initial 1987-88 survey response rate was 32% (30 of 94) which compares to 32% (35 of 108) in 1983 and 38% (27 of 72) in 1980. The total response rate in 1987-88 with resampling was 56%. More professional teams utilized vision consultants in 1987-88 than in 1983 and the number of paid vision consultants increased as well. In the 1987-88 study a greater number of teams utilized the services of ophthalmologists than in 1983, although 19% of the teams indicated they utilized the services of both an ophthalmologist and an optometrist. Utilization of vision screening programs by teams has remained unchanged since 1983 with over 30% of the teams still lacking such a program.

Table 5: Professional Longitudinal Data

	1987-88	1983	1980
Response rate of professional athletic programs surveyed.	56% response [53 of 94]	32% response [35 of 108]	38% response [27 of 72]
Vision care specialists affiliated with professional athletic programs.	93% [49 of 53]	40% [14 of 35]	33% [9 of 27]
Vision consultants paid vs. volunteering their services .	95% paid [38 of 40]	86% paid [12 of 14]	78% paid [7 of 9]
Title or degree of vision consultant, (optometrist, ophthalmologist, or both). (% may not equal 100% due to shared use of O.D.'s and M.D.'s by some teams.)	38% O.D. 81% M.D. [9 of 48, O.D.] [30 of 48, M.D.] [9 of 48, both]	50% O.D. [7 of 14, O.D.] [7 of 14, M.D.]	33% O.D. [3 of 9, O.D.] [6 of 9, M.D.]
Teams using a vision screening program.	68% [34 of 50]	70% [19 of 27]	N.A.
Mean of athletes failing vision screenings.	6% failure	3% failure	1-4% failure
Range of responses for failing screenings.	[0% -30%]	[0% -20%]	
Recommendation of contact lenses over spectacles for athletes.	96% [44 of 46]	62% [18 of 29]	approx. 75%
Percentage of players requiring visual correction utilizing contact lenses.	72%	62%	75%
Ratio breakdown of soft lens wearers to the total of all rigid & soft lens wearers.			
100-76% soft	38	11	12
75-51% soft	6	9	4
50-26% soft	0	2	0
25-0% soft	0	3	5
Contact lens problems most often reported by professional athletes.	loss & irritation	loss & irritation	loss & irritation
Teams keeping extra contact lenses available in case of loss or damage.	96% [50 of 52]	80% [28 of 35]	75%
Teams with someone available to remove a contact lens from an injured athlete.	98% [51 of 52]	91% [32 of 35]	100%
Athletic teams utilizing visual training.	35% [17 of 49]	29% [10 of 35]	football-25% baseball-65%
Vision training technique utilized:			
Vision enhancement	3-not specified [7 of 14, 50%]	4-not specified [2 of 6, 33%]	N.A.
Remedial training	[1 of 14, 7%]	[2 of 6, 33%]	
Combination of both techniques	[6 of 14, 43%]	[2 of 6, 33%]	
Team and/or player improvements associated with vision training.	73% [8 of 11]	40% [4 of 10]	N.A.

N.A.: Denotes information was not available for study subset.

Professional teams now appear to be recommending contact lenses over spectacles more often than in 1983. Once again, contact lens problems most often noted were loss and irritation, and soft contact lenses were utilized over rigid lenses by most team members. Nearly all teams surveyed in 1987-88 indicated they do have a person who is knowledgeable to remove a contact lens from an injured player. Since the 1983 survey an increase was seen in teams keeping extra contact lenses for each player in case of loss or damage.

Pro teams reported an increase in the utilization of vision training programs since 1983. The vision training approach most often utilized was visual enhancement (50%) while a slightly smaller percentage of teams (43%) indicated they used both visual enhancement and remedial training approaches. A large majority (73%) of teams utilizing visual training indicated they had noticed team and/or individual player improvement.

For comparison of sports, professional data were separated into subsets of baseball, basketball, football, and hockey. Professional sports collectively indicated a high percentage of vision consultant utilization. Football and basketball led the list, with each indicating a 100% utilization rate. Professional basketball programs appear to compensate their consultants less frequently and hockey utilizes vision screenings less often than the other sports. Baseball teams indicated that irritation and playing condition abnormalities were the most frequently encountered contact lens problems. This differed from all other subsets in which loss and irritation were the major complaints. Professional basketball utilized vision training less often than other sports.

Table 6: Professional Individual Sport Data

	Baseball	Basketball	Football	Hockey
Response rate of professional athletic programs surveyed.	54% [14 of 26]	48% [11 of 23]	68% [19 of 28]	43% [9 of 21]
Vision care specialists affiliated with professional athletic programs.	86% [12 of 14]	100% [11 of 11]	100% [19 of 19]	78% [7 of 9]
Vision consultants paid vs. volunteering their services .	64% paid [9 of 14]	45% paid [5 of 11]	83% paid [15 of 18]	78% paid [7 of 9]
Title or degree of vision consultant, (optometrist, ophthalmologist, or both).	8 M.D. 57% 3 O.D. 21% 1 both, 14% 2 unspecified	7 M.D. 64% 2 O.D. 18% 2 both 18%	12 M.D. 67% 3 O.D. 17% 3 both 17% 1 unspecified	3 M.D. 43% 1 O.D. 17% 3 both 43% 2 unspecified
Teams using a vision screening program.	83% [10 of 12]	60% [6 of 10]	74% [14 of 19]	44% [4 of 9]
Mean of athletes failing vision screening.	2%	6%	5%	16%
Range of responses for failing screening.	0%-10%	0%-25%	0%-20%	2%-35%
Recommendation of contact lenses over spectacles for athletes.	90% [9 of 10]	100% [9 of 9]	94% [17 of 18]	100% [9 of 9]
Percentage of players requiring visual correction utilizing contact lenses.	50%	52%	72%	76%
Ratio breakdown of soft lens wearers to the total of all rigid & soft lens wearers.				
100-76% soft	8	7	17	7
75-51% soft	3	0	0	0
50-26% soft	0	0	0	0
25-0% soft	0	0	0	2
Contact lens problems most often reported by professional athletes.	Irritation Playing cond.	Loss Irritation	Loss Irritation	Loss Irritation
Teams keeping extra contact lenses available in case of loss or damage.	93% [13 of 14]	100% [10 of 10]	95% [18 of 19]	100% [9 of 9]
Teams with someone available to remove a contact lens from an injured athlete.	100% [14 of 14]	100% [10 of 10]	95% [18 of 19]	100% [9 of 9]
Athletic teams utilizing visual training.	50% [6 of 12]	10% [1 of 10]	33% [6 of 18]	44% [4 of 9]
Vision training technique utilized:	2 unspecified			1 unspecified
Vision enhancement	2 of 4, 50%	1 of 1, 100%	3 of 6, 50%	2 of 3, 67%
Remedial training	0 of 4, 0%			1 of 3, 33%
Combination of both techniques	2 of 4, 50%		3 of 6, 50%	
Team and/or player improvements associated with vision training.	50% [2 of 4]	100% [1 of 1]	67% [2 of 3]	100% [3 of 3]

Discussion

A number of variables must be considered which may have influenced the validity of this survey. Unlike the 1980 and 1983 studies which consisted of only one mailing, two identical surveys were sent in the 1987-88 project to college and professional programs in order to increase sample size. Follow-up surveys were sent only to programs which failed to respond to the first survey. As a result, a much higher response rate was attained for both the university and professional subsets than in previous surveys. The optometry data were generated by a single mailing.

The survey mailing dates varied among the studies (1987-88 initial survey mailed June 20, 1987; follow-up survey mailed June 14, 1988; 1983 survey mailed May 1, 1983; 1980 survey mailed September 4, 1980).

The large increase in vision care specialists affiliated with teams, and the increased percentage compensated for their services may partially stem from the increased response rate in 1987-88. As the level of competition increases, it appears as though vision care consultants are more likely to be retained and paid. This may reflect the greater financial commitment by most professional sports programs.

Respondent bias must also be considered. Optometrists and athletic teams who are interested in sports vision topics may have been more likely to respond to these surveys.

There appears to be a positive shift in the utilization of optometrists and ophthalmologists at both the university and professional levels. Longitudinal data indicate a higher percentage of ophthalmologists than optometrists serving as consultants to professional programs. With the dramatic increase of vision consultants in the professional ranks, one would anticipate a corresponding increase in provision of fundamental vision care services. This was not borne out by the data as the vision screening services have not increased. With ophthalmologists showing a better than 2 to 1 ratio relative to optometric consultants, it appears as though consultants are not

providing comprehensive vision care services and may be consulting on a referral basis only (injury, necessity, etc.). This may be demonstrated by a comment made by a NFL team trainer who indicated the team physician refers all eye care related problems and questions to an ophthalmologist. That particular team did not incorporate a vision screening program. This fact indicates a need for expanded vision care services to these athletic programs and is an issue the optometric profession should address.

Trainers appear to be more informed about vision related factors as demonstrated by the increased utilization of contact lenses, more personnel trained in emergency contact lens removal, and more frequent contact lens preference over spectacles. These increases may result from the increased percentage of consultants to athletic programs.

Despite the extremely high interest in the potential for growth of sports vision demonstrated over the past eight years, the percentage of responding optometrists consulting to teams has remained unchanged. However, it appears as though growth has occurred in the provision sports of vision services within the practice setting since optometrists are considering the specific demands of the athlete more carefully and are providing more vision training services. Practitioners continue to demonstrate their concern for prevention over eye injuries by continuing to promote the use of protective eyewear and by offering them in their practice dispensaries.

Between 1983 and 1987-88, growth in the utilization of vision training may have occurred since optometrists indicated a slight increase in the provision of this service within their services. Both the 1987-88 optometric longitudinal and cross-sectional subsets demonstrated this tendency. University subsets showed little change in vision training utilization while professional teams indicated an increase, probably due to the increased number of optometrists affiliated with such programs. Despite relatively limited literature defining visual enhancement, it appears to be the most popular training approach utilized by consulting optometrists and athletic programs. Since little literature presently exists which defines visual enhancement training, it is likely that there is little or no agreement among practitioners as to what the full scope

of this training actually encompasses. A sizeable increase in professional programs reporting team and/or individual player improvements associated with vision training was noted.

The need for vision screening programs by professional and university teams continues to exist, particularly in colleges with smaller student body sizes (Division III institutions indicated a very low utilization rate). Professional and university data collected in 1987-88 indicated that a higher mean percentage of athletes failed vision screenings as compared to the previous surveys. Despite the increased overall failure rate, the wide range of reported failure rates remained relatively unchanged. Comments made by respondents indicated that both screening techniques and failure criteria varied extensively among programs.

Contact lenses were recommended for athletes more frequently in 1987-88 by both professional and university subsets. It is unknown whether this fact is a result of increased awareness of contact lens benefits or of the recent media exposure regarding contact lenses in general. More professional and university programs indicated they were maintaining spare contact lenses in case of damage or loss and had trained personnel available for emergency contact lens removal. These percentages appear to correlate directly with level of competition (Division III < Division IA < Professional). Once again, these positive shifts may be an artifact of the larger response rate or may be a direct result of increased utilization and/or recommendation of contact lenses. Professional and university programs show an even stronger preference for soft over rigid contact lenses than in the past.

Many differences were apparent between Division IA and Division III programs. The highest response rate observed from all athletic teams was Division IA which may have resulted from various factors. This may represent a greater understanding of the role of vision in sports. Generally, Division IA institutions have more support staff, are supported by strong booster clubs, and have larger athletic budgets. The nature of the surrounds may also play a role since many Division IA schools include health care

programs in their curriculum which may affect responses correspondingly. Division III institutions often have a shortage of personnel which may result in limited opportunity to accomplish tasks or to stay abreast of current trends in health care related issues. Also, teams may not foresee any addition or expansion of their existing vision care programs thus resulting in a lower response rate due to limited interest. Divisional differences were noted in the percentage of teams maintaining a supply of spare contact lenses, utilizing vision training, and retaining contact lens emergency removal personnel. This may be related to inequality of vision consultant utilization.

In final summary, this survey has demonstrated that despite the increase of vision care consultants, an unmet need still exists for the provision of vision care services at the collegiate and professional team level. The increase in numbers of professional consultants has primarily occurred in ophthalmology, however this increase has not paralleled positive growth in vision screenings or related services as one would anticipate. Therefore, the authors feel that much of the increase is related to use of consultants on an "as needed" basis, primarily relative to sports eye injuries. It appears as though many of the present vision care consultants are providing only partial vision care services.

The size and financial resources of various colleges/universities appear to affect the provision of vision care services to their athletes. Vision care services are included less frequently and less completely in Division III than Division IA institutions. The low utilization of vision consultants by Division III teams places greater responsibility on the coaches, trainers, and athletes in the identification and appropriate referral for possible performance limiting visual problems.

The authors feel that vision screenings are an important part of a vision care program, yet many athletic programs lack even the most basic of vision screenings, and those that are provided appear to lack standardization. Based on the predictive trends revealed in this project, the authors feel there may be a greater need for these vision

care services at lower levels of competition such as junior colleges, high schools, and little leagues.

With the present competitive nature of the vision care field there is an emphasis by such groups as the American Optometric Association on enhancement of practice quality and scope. Even though increases in utilization of vision care services are taking place, there still remains an unmet need for consultants to sports programs at all levels of competition. Regarding this issue, most optometrists continue to feel there is potential for growth in the area of sports vision.

Acknowledgements

The author wishes to extend special gratitude and appreciation to the past survey teams; Kent Helmick, O.D. advised by Alan W. Reichow, O.D. - 1983 survey, and Douglas Barton, O.D., Karen Ruckel Cahill, O.D., and Laureen Link, O.D. advised by Norman Stern, O.D. and Roderic Gillilian, O.D. - 1980 survey.

I would also like to thank the optometrists, as well as the coaches and trainers of the sports teams for their assistance in completing and returning the surveys.

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Appendix A

June 20, 1987

As a part of our ongoing research in sports vision, we would like your opinions and perspectives. For the past seven years, we have been offering classroom and clinical programs through our sports vision service, and have been extensively involved in sports vision research. We are proud of our program and are continuing its development to serve the profession.

In 1980 and 1983, we conducted surveys which sampled random optometrists across the country to determine the present and potential roles of the profession in the area of Sports Vision. This 1987 survey is a continuation of the past two surveys, and will serve to compare trends longitudinally as well as assess the trends and interest in Sports Vision as an optometric specialty area.

You have been chosen at random to participate in the present survey and we hope you will assist us. Please complete the attached five minute questionnaire and return it to us in the enclosed envelope as soon as convenient and no later than July 20. Response rates to the past surveys have been exceptionally good and with your help we are aiming for 100% response this year. Your cooperation and assistance is greatly appreciated.

Blaine G. Zieman, B.A.

Bradley Coffey, O. D., Advisor

Alan W. Reichow, O.D., Advisor

Enclosure

Please circle **YES - NO** or fill in the blanks as necessary; use back when needed.

1. Are you presently serving as a vision consultant to a high school, college, or professional sports team. **YES NO**
 If so, name the team level, and describe your responsibilities: _____

 If so, do you provide some level of specific sports vision care? **YES NO**
 If so, are you on the payroll, or is the program voluntary? _____
 If so, estimate the percentage of practice income (gross), which is directly derived from these services. _____
 Practice income indirectly derived? (public relations, market image, professional or sports courtesies, etc). _____

2. Do you feel there is a potential for optometric growth in the field of sports vision? **YES NO**
 If so, how? _____

 What do you feel is presently the most pressing need for continued development of sports vision as an optometric specialty area?

greater public awareness	research	continuing education
greater financial incentive	instrumentation	
other _____		

3. In your practice, do you consider the specific visual demands of the athlete separately when prescribing for the high school or college student? **YES NO**
 If so, please give an example: _____

4. Do you prefer prescribing contact lenses vs. spectacles in certain sports? **YES NO**
 If so, what sports and why? _____

 If so, do you have a preference for soft vs. rigid lenses? _____
 Do you advocate the use of extended wear lenses for athletes? **YES NO**

5. Do you suggest and utilize visual training/therapy for athletes? **YES NO**
 If so, are the techniques used mostly for remedial training or visual enhancement? _____

6. What professional aspect of your practice do you find most satisfying, fulfilling, or exciting?

7. In your practice, do you promote the use of prescription or non-prescription athletic eyewear? **YES NO**
 If so, does your facility include a dispensary where protective eyewear is available to athletes? **YES NO**

8. For the past seven years, Pacific University has offered an elective course in sports vision to students. A condensed version of this course entitled; "Comprehensive sports vision Care: A Performance Oriented Approach", is also being offered to optometrists for continuing education credit. Would you be interested in this course? **YES NO**

9. If you are interested in the results of this survey, please contact Pacific University, College of Optometry, sports vision Service.

June 20, 1987

Over recent years, there has been a dramatic increase in the awareness of the critical nature of vision in peak sports performance. Much of this awareness has resulted from work performed at Pacific University College of Optometry, considered to be a leader in the discipline of sports vision.

Pacific University's Sports Vision Program, which has existed for seven years, is comprised of research, educational, and clinical services. Highly specialized sports-oriented vision care is provided to athletes at all levels of competition through its clinical program. As part of the ongoing effort to better serve athletes, the Sports Vision Service at the Pacific University College of Optometry has in the past seven years conducted two surveys of college and professional sports teams. The intent of the past surveys was to determine the utilization of vision care services in various sports. We are presently conducting a follow-up survey which will compare longitudinally to the past studies, as well as assess the present and potential roles of vision care specialists in sports.

It is our intention that dissemination of the information collected via this survey will benefit athletes, athletic teams, and vision care practitioners. We have enjoyed an excellent response rate from teams surveyed in the past. The current survey, a ten minute questionnaire is enclosed. We request that it be completed by the coach, trainer, or vision care specialist as is appropriate. Thank you in advance for your input; we appreciate your assistance. Please return the survey in the self-addressed stamped envelope as soon as convenient.

Blaine G. Zieman, B.A.

Bradley Coffey, O.D., Advisor

Alan W. Reichow, O.D., Advisor

Enclosure

June 20, 1987 **January 14, 1988**

Over recent years, there has been a dramatic increase in the awareness of the critical nature of vision in peak sports performance. Much of this awareness has resulted from work performed at Pacific University College of Optometry, considered to be a leader in the discipline of sports vision.

Pacific University's Sports Vision Program, which has existed for seven years, is comprised of research, educational, and clinical services. Highly specialized sports-oriented vision care is provided to athletes at all levels of competition through the clinical program. As part of the ongoing effort to better serve athletes, the Sports Vision Service at Pacific has conducted two surveys of college and professional sports teams in the past seven years. The intent of the past surveys was to determine the utilization of vision care services in various sports.

In June, we sent you a follow-up survey which compared longitudinally to the past studies, and assessed the present and potential roles of vision care specialists in sports. Although your organization was included in our mailing, we did not receive a response from you. Recognizing that summer months present various limitations to trainer/coach/consultant availability, an identical survey is attached. Your team's input will directly benefit this study and may indirectly impact the quality of vision care/enhancement in your athletic program. For this reason, the importance of your response cannot be stressed enough.*

We believe that dissemination of the information collected via this survey will benefit athletes, athletic teams, and vision care practitioners. The current survey, a ten minute questionnaire, is enclosed. We request that it be completed by the coach, trainer, or vision care specialist as is appropriate. Thank you in advance for your input; we appreciate your assistance. Please return the survey in the self-addressed stamped envelope as soon as convenient.

Blaine G. Zieman, B.A.

Bradley Coffey, O.D., Advisor

Alan W. Reichow, O.D., Advisor

Enclosure

*Paragraph insert: **January 14, 1988**

Please circle (YES - NO) or fill in the blanks as necessary; use back when needed.

Name: _____ Position on Team: Coach _____ Trainer _____
 Vision Care Specialist _____ Other: _____

Sport: _____

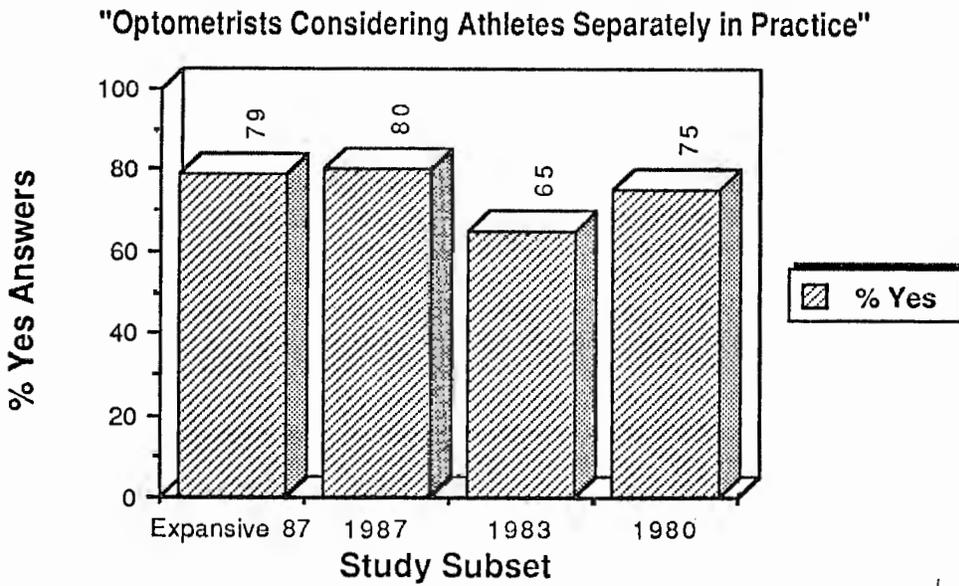
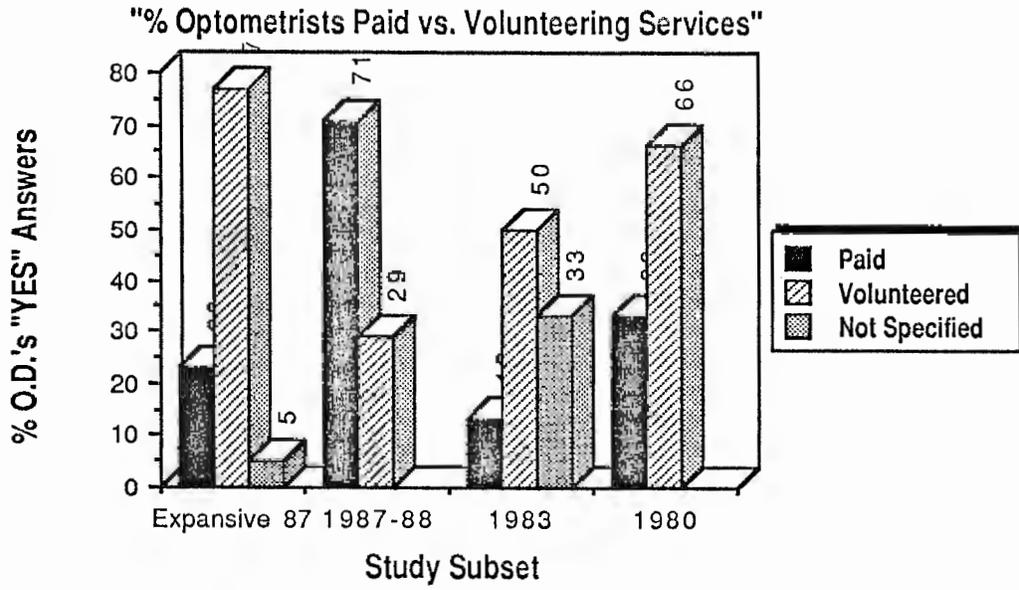
University: _____ Team: _____

1. Is there a vision care specialist affiliated with the team? **YES NO**
 If so, are services volunteered or contracted? _____
 If so, what title does he/she hold? (Optometrist, Ophthalmologist, etc.) _____
 If so, how has the team benefitted? _____
2. Does your team utilize a vision testing program? **YES NO**
 If so, what percentage of the players screened failed visual requirements when tested? _____
 If so, what were the criteria for passing? _____
3. What percentage of players requiring visual correction are wearing contact lenses? _____
 Of those, what is the ratio of soft to hard lenses? _____
4. What are the most frequent problems with contact lenses (e.g., loss, glare, irritation, due to playing conditions, etc.)? _____
5. What is the ratio of full-time contact lens wearers to those wearing their lenses only for the playing time and practices? _____
6. Are there extra contact lenses kept for each of the players in case of loss or damage to the lens? _____
7. Is there someone knowledgeable to remove contact lenses from an injured player? **YES NO**
 If so, who? _____
8. Are contact lenses recommended over spectacles for participation in this sport? **YES NO**
 Comments: _____
9. Do you use visual training (V.T.) in your program? **YES NO**
 If so, is the V.T. for remedial care or for visual enhancement (e.g., eye-hand coordination, tracking skills, reaction/response speed, etc.)? _____
 If so, what techniques are used? _____

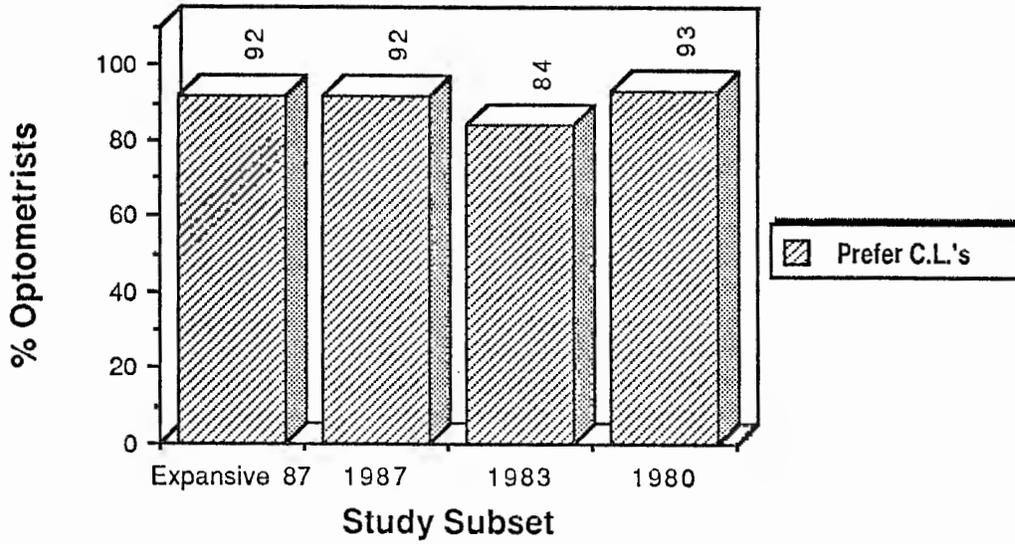
 If so, have individual or team improvements been noted? **YES NO**
 What sort of improvements? _____

10. Pacific University College of Optometry offers sports vision seminars comprised of educational presentations and hands-on demonstrations to coaches, trainers, and other sports-related personnel. Are you or other representatives of your team interested in such a conference? **YES NO**
 If yes, would you prefer attending such a conference in Oregon or having this program presented at your facility? _____
11. Are you interested in receiving the results of this survey? **YES NO**
12. Comments, if any (use back of page if necessary): _____

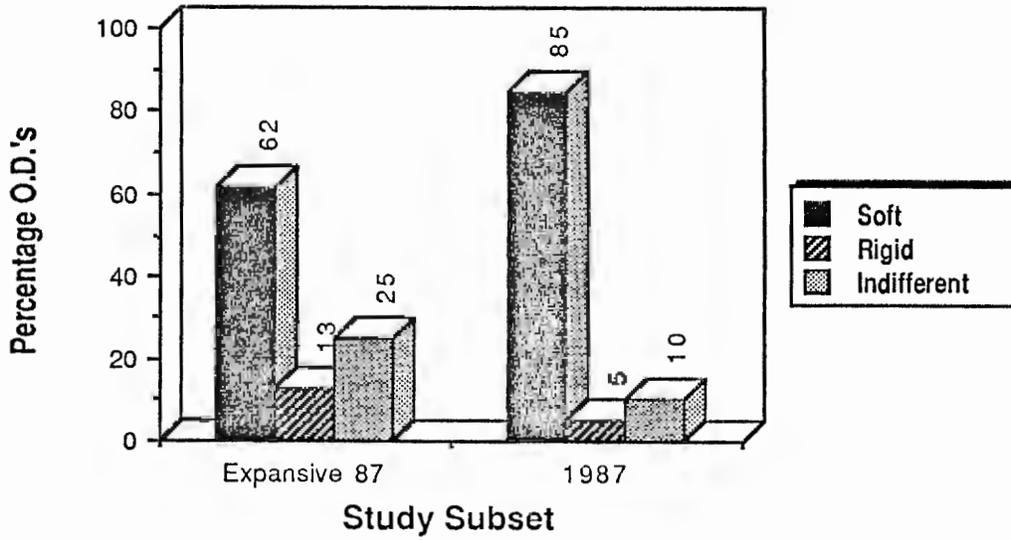
Appendix B



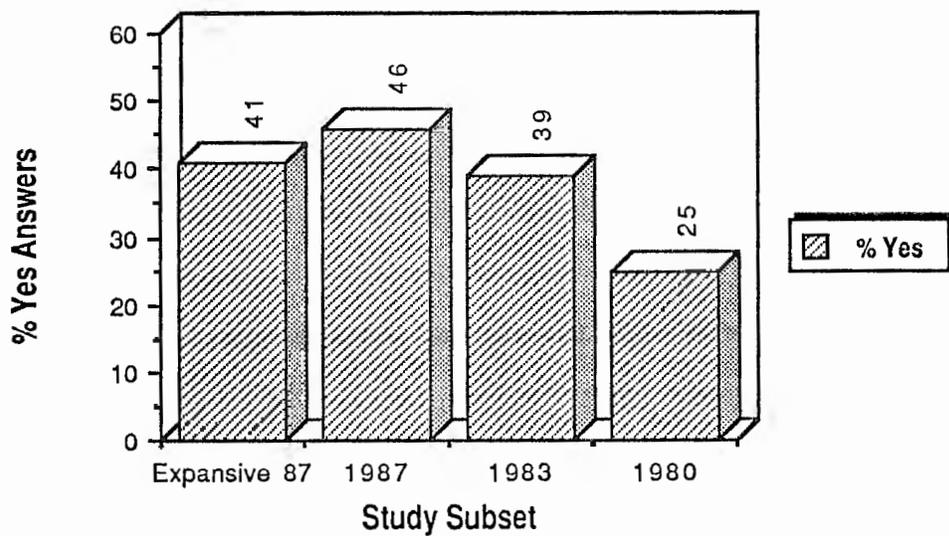
"% Optometrists Preferring Contact Lenses Over Spectacles"



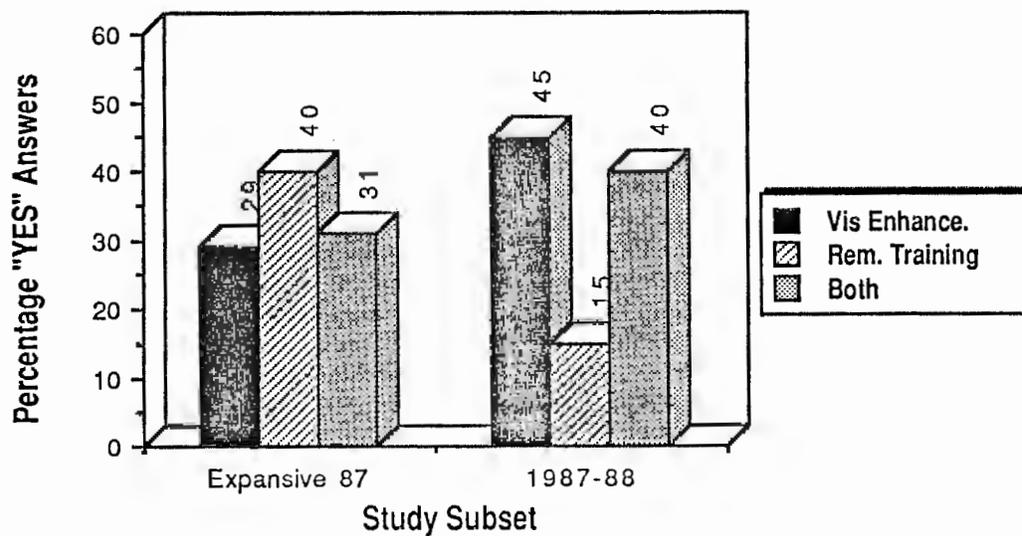
"Optometrists Preference of Soft vs. Rigid Lenses"

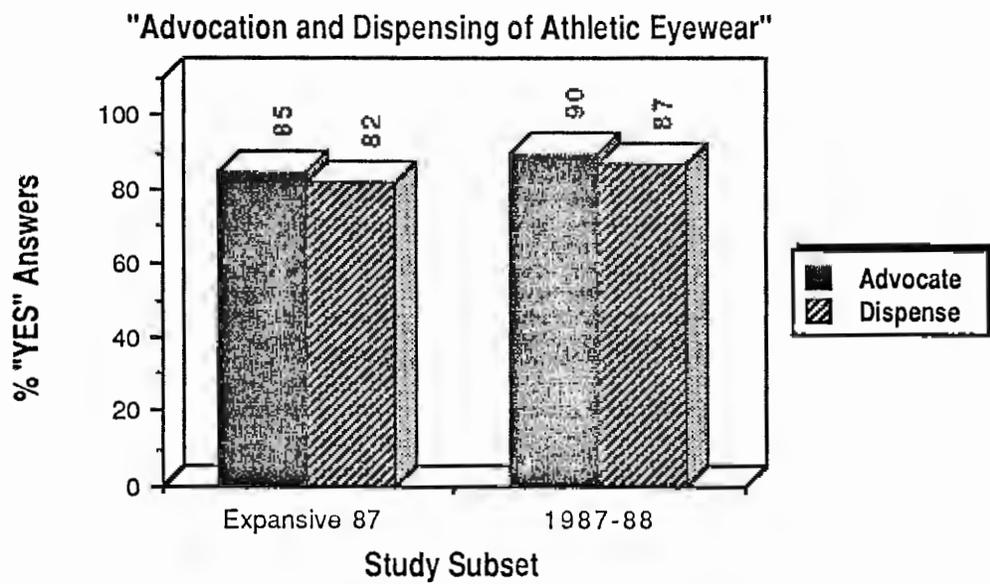


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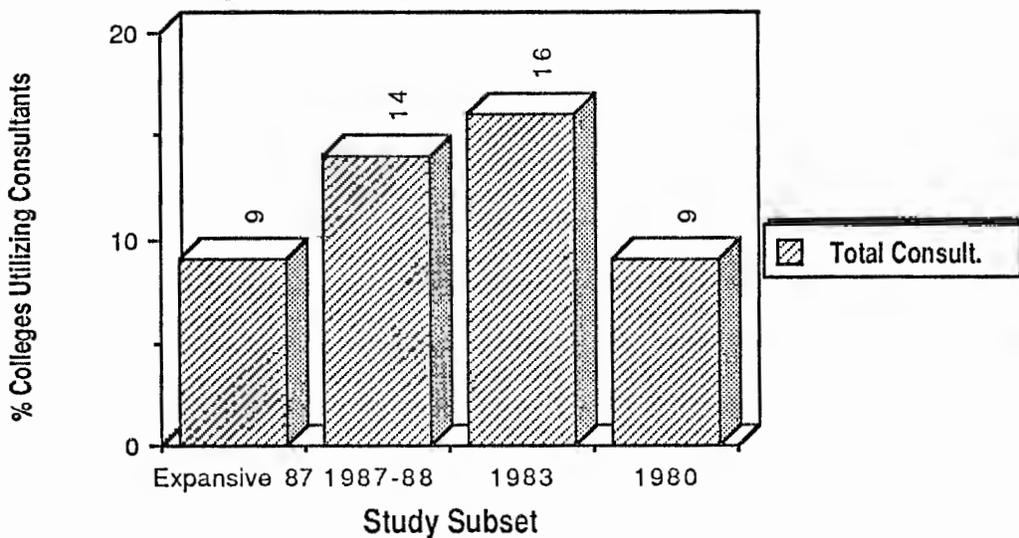


"Optometric Vision Training Techniques Utilized"

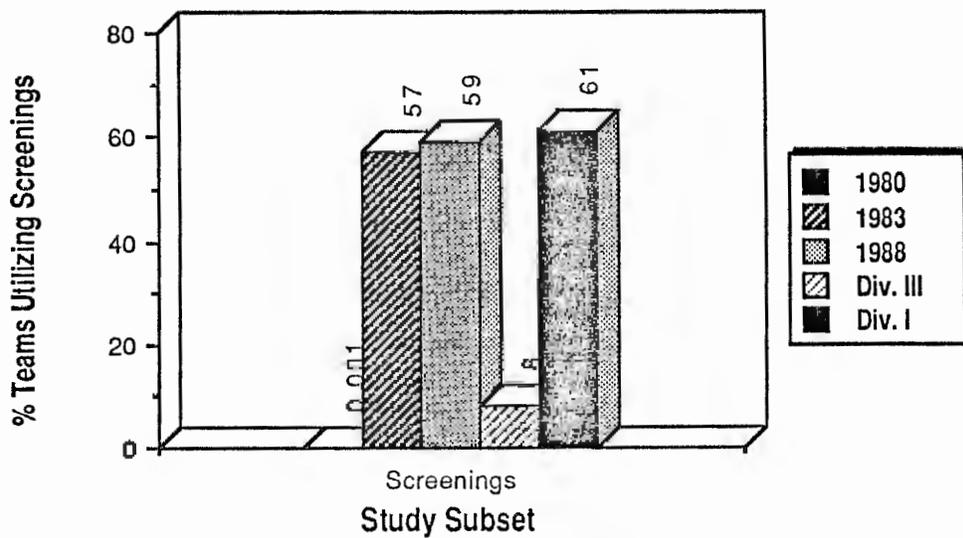




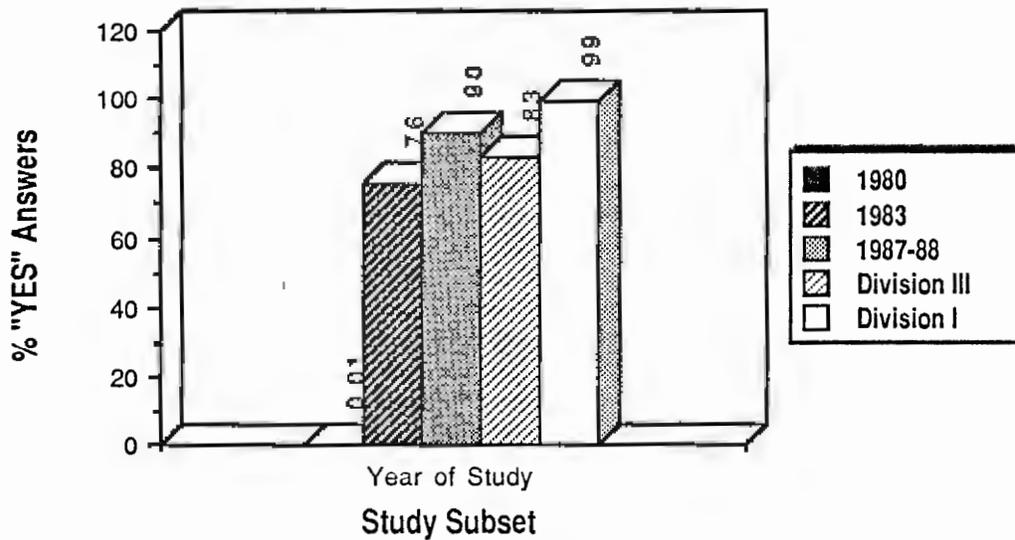
"% Colleges Utilizing a Vision Care Specialist"



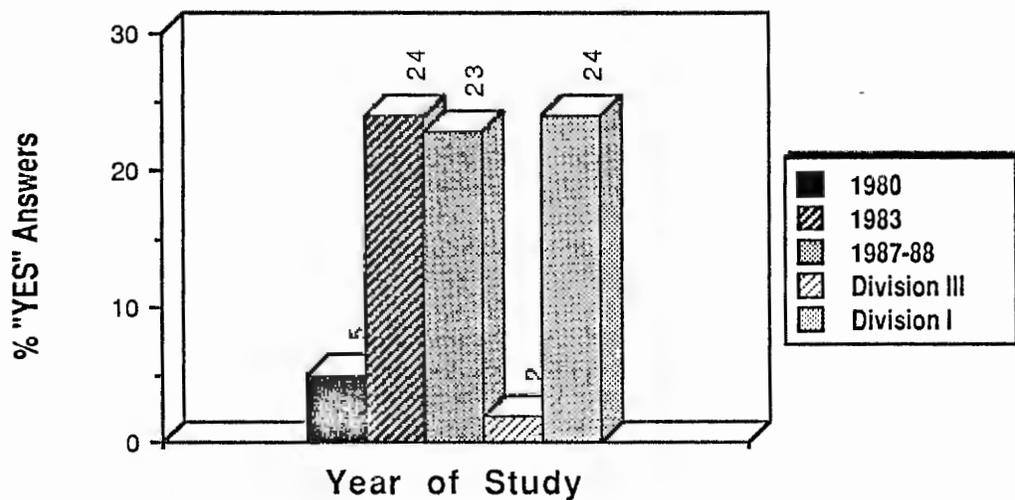
"% Athletic Teams Utilizing a Vision Screening Program"



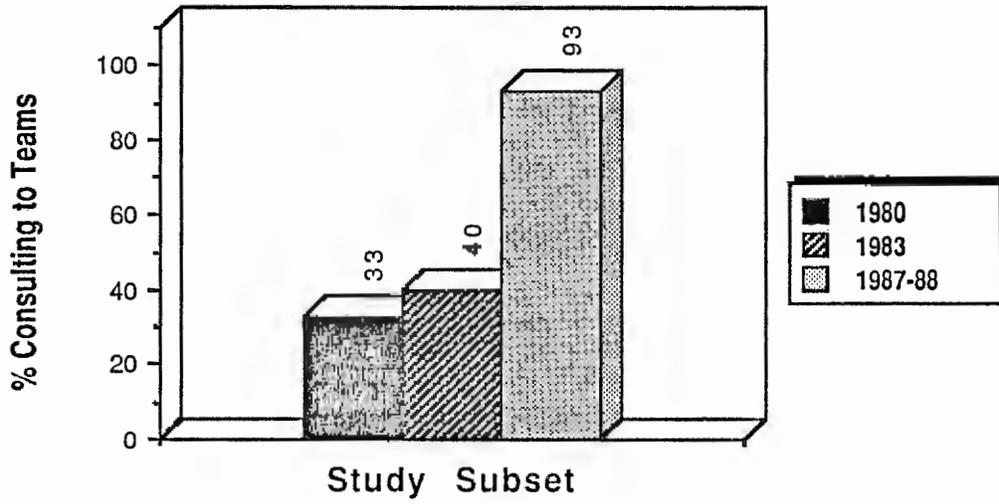
"Colleges With Person Able To Remove Contact Lenses"



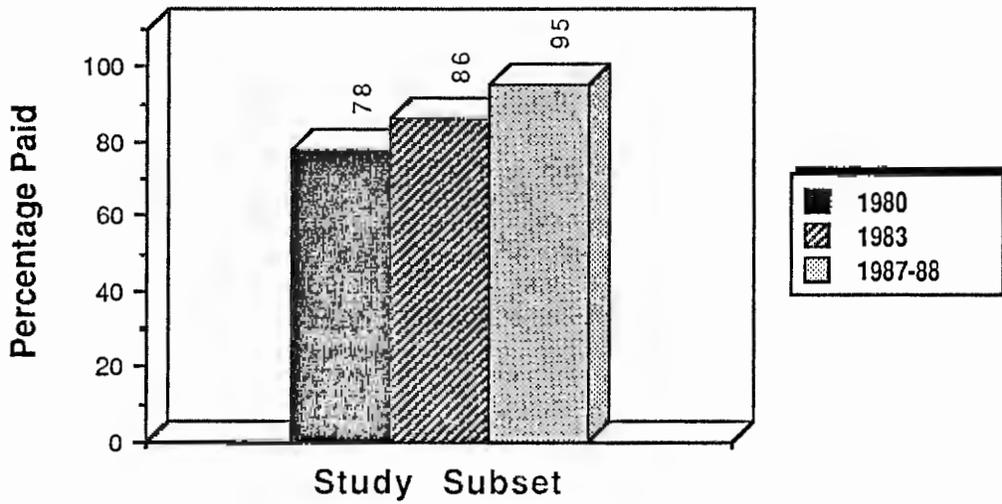
"Colleges Utilizing Vision Training"



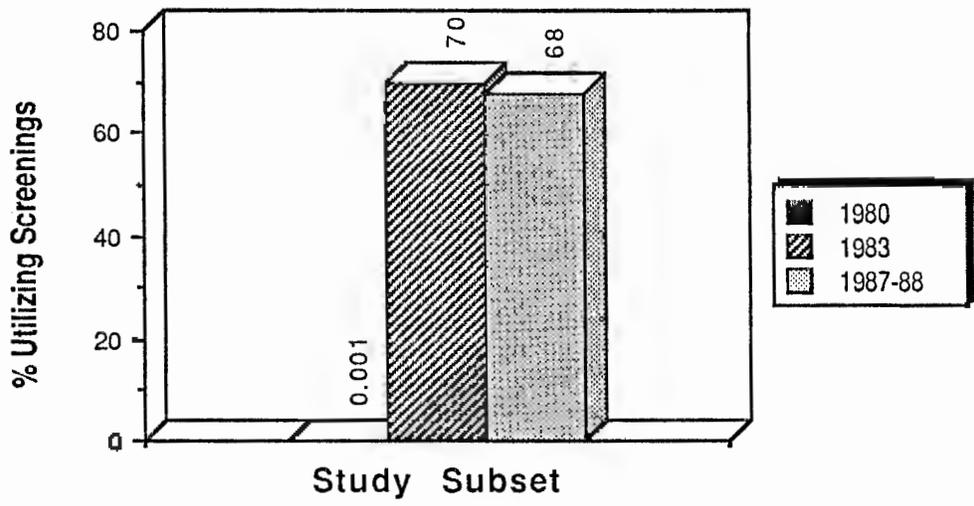
"% of Practitioners Consulting To Professional Teams"



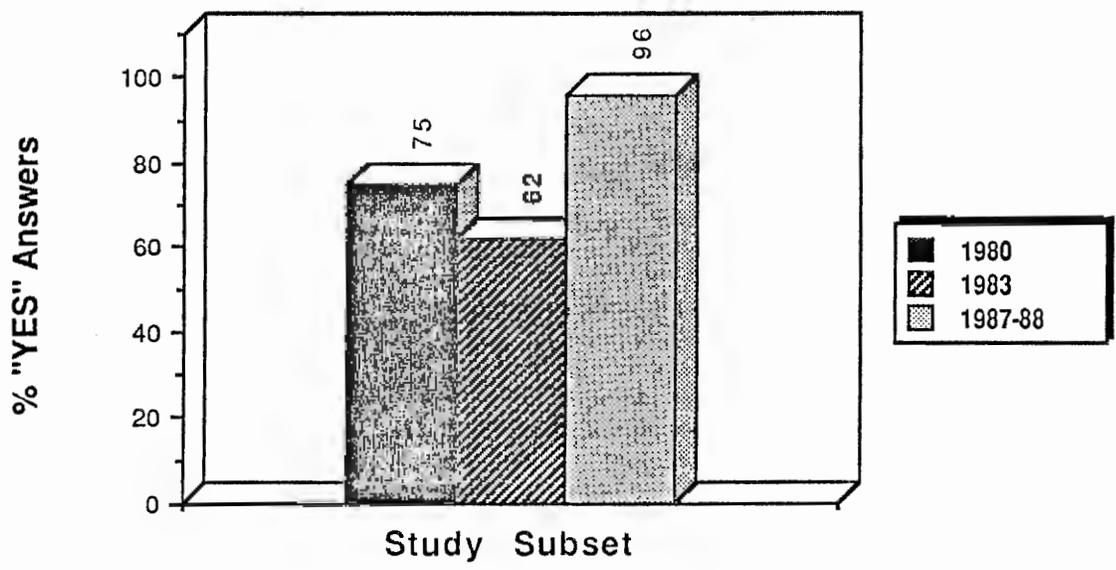
"% Paid For Consulting Professional Teams"



"Professional Teams Utilizing a Vision Screening Program"



"Professional Teams Recommending Contact Lenses Over Spectacles"



"Professional Teams Keeping Extra Contact Lenses Available"

