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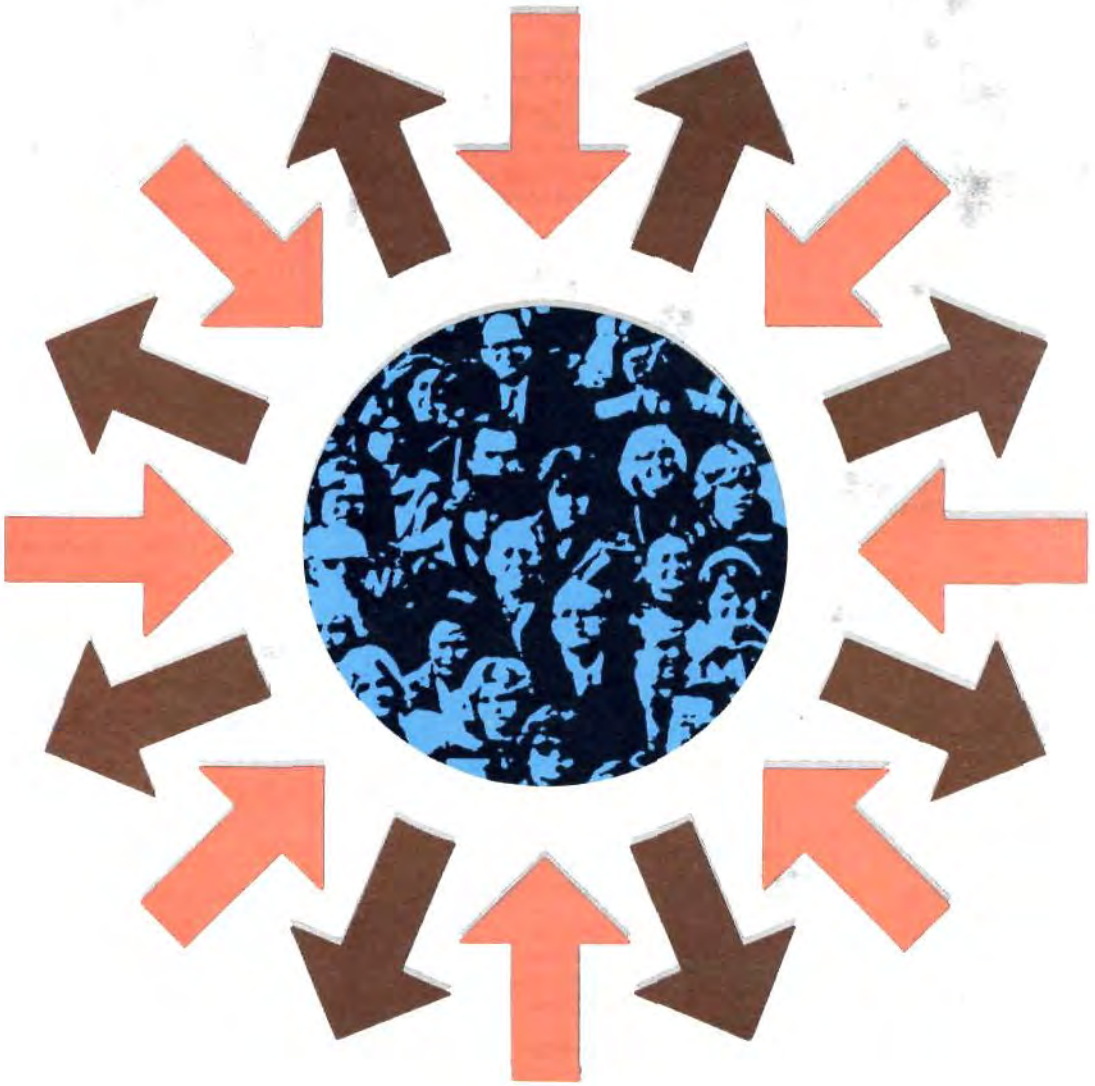

WOULD A NATIONAL CENTER FACILITATE HEALTH PROFESSIONS EDUCATION RESEARCH?

Association of Schools and Colleges of Optometry

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DEPARTMENTS

The **JOURNAL OF OPTOMETRIC EDUCATION** is published by the Association of Schools and Colleges of Optometry (ASCO). **Managing Editor:** Patricia Coe O'Rourke. **Art Director:** Dan Hiatt, Graphics in General. Business and editorial offices are located at 6110 Executive Boulevard, Suite 514, Rockville, MD 20852 (301) 231-5944. **Subscriptions: JOE** is published quarterly and distributed at no charge to dues-paying members of ASCO. Individual subscriptions are available at $15.00 per year, $20.00 per year to foreign subscribers. Postage paid for a non-profit, tax-exempt organization at Rockville, MD.

EDITORIAL

Educational Research in Optometric Education

In the past few years a growing concern about the status of optometric education has been voiced. There is an increased recognition of the need to understand more completely the appropriate educational responses to the sweeping changes within our profession and society itself. There is renewed interest in completing a national study similar to the 1973 Havighurst study, the most recent comprehensive study of optometric education. Such interest is consistent with a national awakening of concern for higher education in general. Study after study has commented on the decline of American higher education. The quality of education has been called into question and the demand for reform is rising. Realistically, reform requires large resources and a better understanding of the interaction between teaching and learning processes. Both elements, as they apply to health professions education, are addressed in a recent article by Wartman and O'Sullivan which is reprinted in this issue of the *Journal*.

The call for a national center for health professions education research by Wartman and O'Sullivan could not be more timely. Their article raises many troublesome questions about the status of educational research, not only for medical education but for all health professions. I am sure many colleagues will disagree, but it is my opinion that we give little research attention to the questions of how students learn or what methods best improve achievement of desired educational outcomes. In fact, in many situations we probably fail to adequately assess whether students have learned at all. Without strong educational research, our programs will be doomed to mediocrity.

While educational practice receives little attention through research, it is more disturbing that faculty and administrators, in general, pay little attention to the research literature. We rely in practice on old teaching strategies that emphasize the presentation of facts. Even worse, our assessment of learning is often limited to judging a student's ability to store facts. This occurs even though we have come to recognize that learning is not limited to the acquisition of knowledge but also involves developing abilities in judgment, thinking, integration, and self-learning.

Educational research can assist in evaluating program outcomes, developing appropriate measures of learning and designing effective teaching strategies to enhance learning. Our schools and colleges must link their teaching approaches to the cognitive strategies of their students and to the cognitive demands of optometric practice. If there is an overall shortcoming, it is that for too long we have emphasized the assessment of teaching, independent of learning. Good teaching is of little use if learning is not occurring; the two must be intrinsically linked.

In order to develop a sound research base in education, we first need a committed faculty and administration. This by no means should be taken for granted. As Wartman and O'Sullivan point out, educational research is often regarded with skepticism. We must overcome bias and develop a national cadre of educational researchers. Obviously, a national center for research would assist in this effort. Nay, a national center is essential to this effort.

The concept for a national center for health professions education research must be moved to reality. One possible mechanism for achieving this goal is its inclusion within the federal health manpower legislation which will be renewed in 1991. The health manpower bill authorizes those programs which are administered by the Bureau of Health Manpower within the U.S. Public Health Service. This agency is a more appropriate site for a national research center than those suggested by Wartman and O'Sullivan. Regardless, I encourage you, our educational leaders, to respond positively to the call for support. If we are to improve the way we educate optometric students, we must conduct quality educational research. That effort needs to evolve within our academic institutions. It must begin with our current leaders, and it must begin today.

Larry R. Clausen, O.D., M.P.H.
President ad Interim
The New England College of Optometry

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B.J. Shannon, O.D., F.A.A.O.
Executive Director, Professional Services
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LEE W. SMITH, M.P.H.

February 28, 1928–September 10, 1989
ASCO Executive Director 1977–1987

Lee W. Smith was born in Pittsburgh, Pennsylvania, on February 28, 1928. Following four years' service in the United States Navy, he began undergraduate work at the University of Pittsburgh, where he received a bachelor of science in bacteriology and a master of science in microbiology. He became a research associate in the Graduate School of Public Health and earned a master's in public health in 1958.

Lee joined the Public Health Service as laboratory director, Encephalitis Investigations Unit, of the Center for Disease Control in Greeley, Colorado, and later as a research associate for the National Institute of Allergy and Infectious Diseases at the National Institutes of Health, Department of Health, Education and Welfare. He continued his professional experience with HEW in many capacities and served the Department as a placement officer, deputy chief and chief of the Personnel Utilization Branch in the Office of Personnel and later held administrative positions for the Division of Operations and Services, the Office of Personnel and Training and the Office of the Secretary of HEW.

Lee served as special assistant to the deputy surgeon general and as director, Office of Personnel Management, Office of Assistant Secretary for Health (HEW). In 1971 he was selected to be assistant surgeon general and later served as the associate director, Bureau of Health Manpower, Health Resources Administration, U.S. Public Health Service. Lee retired from the United States Public Health Service with the rank of Rear Admiral in December, 1977.

In 1977, following an extensive search, the selection committee of the Association of Schools and Colleges of Optometry recommended Lee Smith for the position of executive director. Lee was quick to assume his responsibilities, he understood health issues and legislation and he had a feel for the Washington scene. In a short time it was apparent that ASCO and optometry had gained the talents and services of a talented and dedicated man.

Lee was considered by ASCO member institutions to be most effective in working with the many personalities within optometric education. He quickly grasped the many intricacies of the optometric profession. He was dependable, discrete and effective in dealing with the American Optometric Association, the Veterans Administration, and with state, regional and federal governmental agencies. He was ASCO's representative to the International Optometric and Optical League, and was an active participant in its Committee on Education.

Lee retired in 1987 to Bradenton, Florida, with his wife, Alma, to enjoy the sunshine and golf. But although Lee waged a valiant fight, the cancer that had developed shortly before his retirement led to his death on September 10, 1989. Memorial services were held at the Oneco Methodist Church in Bradenton, with burial at Arlington National Cemetery, Arlington, Virginia.

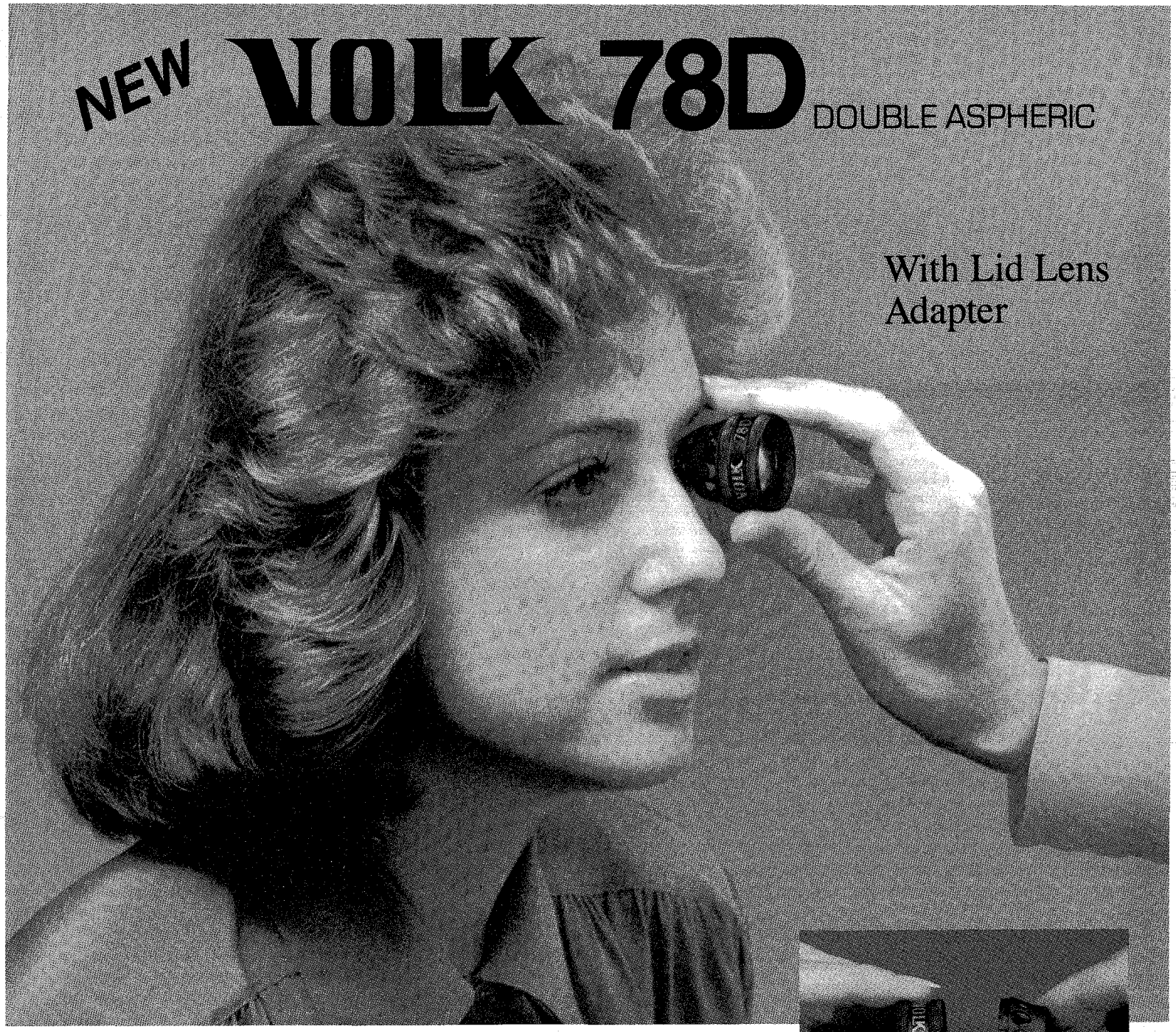
Those of us who worked with Lee fondly remember him for the professional that he was. His concern for optometric education and his efforts to improve our schools and colleges were commendable and earned the sincere respect of all who knew and worked with him. The many friends he made in the decade that he was affiliated with optometry will truly miss his presence, but the memories of his efforts on our profession's behalf and the warmth of his friendship are his lasting gifts.

He is survived by his devoted wife, Alma, three children—Barbara Smith, Kathryn McGee and Steven Smith—three stepsons, and eight grandchildren. All in optometry share with Alma and his loved ones a profound sense of loss. We have lost a friend, a gentleman and a public health servant who will long be remembered.

Richard L. Hopping, O.D., D.O.S.
President, Southern California
College of Optometry

In Memoriam

NEW VOLK 78D DOUBLE ASPHERIC



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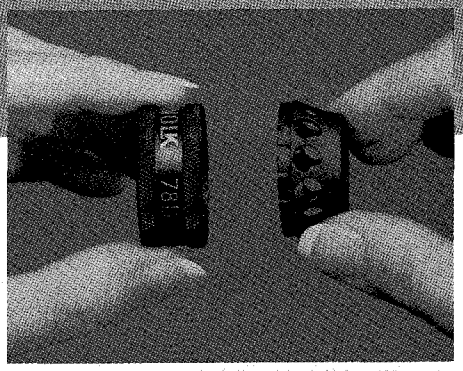
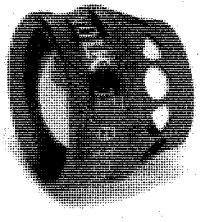


Simply insert the Volk Lid Lens Adapter into the lens retaining ring for improved lid control and lens stability during slit lamp indirect ophthalmoscopy.



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SUSTAINING MEMBER NEWS

Sustaining Members support ASCO initiatives on behalf of the optometric education community. Sustaining members are listed on the inside front cover of each issue. Membership is open to manufacturers and distributors of ophthalmic equipment and supplies, and pharmaceutical companies.

Allergan Announces Advanced Formulation for Severe Dry Eyes

Allergan Pharmaceuticals announced a major advancement in dry eye therapy formulated especially for the severe dry eye patient. Celluvisc™ (carboxymethylcellulose sodium) 1% Lubricant Ophthalmic Solution is a new and advanced preservative-free ocular lubricant.

The advanced formulation contains electrolytes to help maintain the integrity of the cellular surface and promote a healthy environment for corneal and conjunctival tissue. Celluvisc provides preservative-free safety and comfort. Its long-lasting effect may be due to the fact that it is anionic. In this regard, it is similar to naturally occurring mucin which promotes adherence of the tear film to the ocular surface.

Allergan Pharmaceuticals has long been recognized as a leader in dry-eye treatment. In 1986 Allergan introduced Refresh® (polyvinyl alcohol 1.4%, povidone 0.6%), the first preservative-free, unit-dose artificial tear. Celluvisc, a second nonpreserved tear, was developed by Allergan specifically to meet the needs of severe dry eye sufferers, many of whom require electrolyte supplementation in addition to long-lasting relief. □

CIBA Vision Launches New Bifocal Soft Contact Lens

CIBA Vision™ has introduced a new bifocal lens, the SPECTRUM® Bifocal (vifilcon A) soft contact lens. With an estimated presbyopic population of over 100 million by the year 2000, the company is focusing on programs to help practitioners better meet the needs of this significant market segment.

"SPECTRUM Bifocal lenses extend the family of SPECTRUM® soft contact lenses to meet the needs of these aging baby boomers," CIBA Vision President Jim Callahan noted. "We think that the appearance-conscious generation of new presbyopes may not want to start wearing spectacles or abandon their contact lenses. The market potential for bifocal lenses is huge: Only about seven percent of people over 40 requiring vision correction now wear contact lenses."

The new SPECTRUM Bifocal lens offers patients outstanding comfort as well as binocular vision because of its concentric design, which has no prism ballast or truncation to cause irritation. A light blue visibility tint for ease of handling and 55 percent water content for flexible wear provide the convenience patients expect.

To help professionals better reach their expanding presbyopic patient base, CIBA Vision has developed a practice-building program as part of the SPECTRUM Bifocal product launch. A practice promotion kit includes marketing recommendations for patient videos, brochures, and newsletters, as well as how to develop relationships with local media and build referrals from colleagues who choose not to fit bifocal lenses.

Based in Atlanta, CIBA Vision Corporation is a leading manufacturer of contact lenses and lens care products. CIBA Vision products are available in 15 countries throughout the world, plus the United States. □

Canadian Practitioners Rate Wesley-Jessen Colors

A survey of optometrists and opticians in Canada found Wesley-Jessen's DuraSoft Colors command an 82% share of the opaque lens market there.

Conducted by Philip Levenstein & Associates, the survey of 306 practitioners in Montreal, Toronto and Vancouver also found:

- 35% of practitioners only use DuraSoft Colors, despite the fact that the Mystique lens (CooperVision's) is available in Canada;
- 74% of practitioners prefer DuraSoft Colors over Mystique;
- 50% cited "more natural looking" as their reason for preferring DuraSoft Colors. Another 27% cited "better color/more beautiful." The reasons equally cited for preferring DuraSoft Colors were larger color selection, broader parameter range and easier to fit.

Among specific colors where comparisons were possible, 91% reported preferring DuraSoft Colors Jade Green over Mystique's version of the same color. Nearly the same percent, 89%, preferred W-J's Sapphire Blue, while 83% preferred W-J's Baby Blue over CooperVision's comparable Crystal Blue.

In addition to cosmetic differences, DuraSoft Colors and Mystique differ clinically. For example, Colors is a flexible wear lens of 55% water content, versus the 38% water content of the daily-wear Mystique. Oxygen transmissibility of DuraSoft Colors is also higher—33.6 versus 16.7. In addition, the DuraSoft Colors is both thinner in the center (.05mm versus .06mm) and at the edges (.14mm versus .18mm) than the Mystique. □

Varilux Incentive Program for Practitioners

A nation-wide incentive program called "Passport To Paris" has been launched by Varilux Corporation which provides a reward to eye care practitioners for increased usage of the Varilux product line of progressive lenses. The incentive program will run until January 31, 1990.

"Passport To Paris" permits the practitioner to win high quality French oriented merchandise and ultimately a trip to Paris. Merchandise can be earned related to the number of Varilux Infinity or Varilux Plus fit. Use of Varilux Infinity will earn rewards at a higher rate than Varilux Plus. As an added bonus, each redemption card will act as an entry to our drawing for one of eight free trips for two to Paris, France (one winner per Varilux district), making the chance to win a real possibility within a district.

"By offering this incentive, we can generate some excitement and fun, motivate and reward practitioners who are key to our success. Their practice profitability benefits, as does the Varilux brand," said Claire Lauhon, product manager. "Participation in the 'Passport To Paris' program in and of itself will provide long term business rewards."

To support this effort to increase sales, Varilux point-of-purchase materials are available: counter cards, consumer information brochures and posters that tie into the "Presbyopia" consumer advertising campaign currently running in major consumer publications around the country, and also tie into Varilux Infinity. And should eye care practitioners want to learn more about Varilux Infinity and the Progressive Opportunity, a 6 minute video and related materials are available at no cost to the practitioner. "We urge professionals to use these recognizable materials available to them to communicate with their patients and thereby increase sales," said Lauhon.

For more information on the eye care practitioner incentive program, please contact your Varilux Laboratory or Varilux Corporation, ATTN: Passport to Paris, 322 Lakeside Drive, Foster City, California 94404 or call 1-800-BEST-PAL. □

Sola, Marchon Launch Media Tour

Sola Optical and Marchon sponsored a tour of major U.S. cities this fall to promote eyewear fashion for people over forty. The theme of the tour was "Over 40 and Looking SPECtacular."

Camille Faure-Bent, associate editor for *Harper's Bazaar,* represented Sola and Marchon on local television talk shows and news broadcasts. Using models over forty, she presented "before" and "after" demonstrations of how presbyopic men and women can create a fashionable, youthful image by switching from bifocals to progressive lenses and selecting the appropriate frames.

Mark Sachs, merchandising and promotions manager for Sola, feels the tie-in between Sola

progressives and Marchon frames is a natural. "Many consumers think eyewear fashion stops with their frames," says Sachs. "But why select a pair of flattering frames and then add years to your looks by pairing them with bifocals? With Sola progressive lenses, presbyopes can improve their appearance as well as their vision."

Donna Rollins, director of marketing for Marchon, sees eyeware as a way to accent the wardrobe as well as improve overall appearance. "Most people spend more time selecting their shoes than their glasses, but the first thing we notice about a person is her face, not her feet," she says. "We'd like to introduce the idea of a 'wardrobe' of glasses to suit different occasions and moods."

Sola Optical is the only lens manufacturer that offers a "Family of Progressives" to meet the different needs of new and advanced presbyopes. In XL, control of peripheral astigmatism is so remarkable, that it actually seems like a single vision lens to first-time progressive lens wearers. To meet the expectations of current bifocal wearers, VIP has a wide reading area, good peripheral clarity, and a generous intermediate for clear mid-range vision. For patients who are not XL or VIP candidates, Sola's new advanced flat top, SmartSeg, is the perfect alternative. □

Paragon Adds International Post

Paragon Optical has named Jeanne A. Bear to the newly created position of director of international sales. The announcement was made by Donald J. Ratkowski, President of Paragon Optical. Citing Ms. Bear's 12 years of experience, Ratkowski said: "Jeanne Bear's diverse background in domestic and international sales and marketing make her ideally suited to her responsibilities here at Paragon Optical." According to Ratkowski, Ms. Bear's primary objective will be to expand its international distribution and sales network for the company's line of rigid gas-permeable (RGP) contact lens materials, trademarked FluoroPerm and Paraperm. In doing so, she will have the vast international resources of Pilkington Visioncare upon which to draw for support.

Paragon Optical, based in Mesa, Arizona, is an innovative manufacturer of RGP contact lens materials, including FluoroPerm 92, FluoroPerm 60, FluoroPerm 30, Paraperm O_2 and Paraperm EW. In addition to developing several new polymers for contact lenses, Paragon is also the technology leader in molding materials for RGP lens use. The company markets its products through a network of high quality laboratories. □

Sola Optical Releases Smartseg® Training Video

Sola Optical has released a training video tape called "How to Fit and Dispense SmartSeg—The New Standard in Flat Tops." Sola is distributing the tape to eyecare professionals for only $4.95. The 10-minute video describes when to recommend and how to fit and dispense the patented new lens.

"The video stresses that SmartSeg is easy to fit and dispense, and that it's a better choice than ordinary flat tops," says Mark Sachs, Merchandising and Promotion Manager. "It presents a case study that shows when to recommend and how to fit and dispense SmartSeg."

SmartSeg, an advanced new flat top, provides bifocal wearers with the mid-range vision that regular flat tops miss. The power in the flat top segment increases gradually as the eye moves from mid-range to near vision, so the wearer sees as clearly from 10 feet as from 10 inches. This gradual, progressive power makes adaptation easy.

The new SmartSeg training video is available in VHS. To order a copy, call Sola Customer Service at (800) 358-8258, press 2. □

New Presbyopic Fitting System Available from Bausch & Lomb

With both consumer and professional interest in bifocal contact lenses growing, Bausch & Lomb has developed a unique, easy-to-use system of soft contact lens for presbyopic fitting.

The new, self-contained Presbyopic Fitting System includes 42 lenses representing the company's complete line of presbyopic options, packaged with patient screening and fitting guides and patient communication material.

Bausch & Lomb has the industry's most complete bifocal fitting system, including the Bi-Tech™ bifocal, an alternating vision design; the PA-1® bifocal, a simultaneous vision design; and lenses from its premium Optima™ family, used for monovision fitting.

"Bifocal contact lenses have become one of this industry's key growth areas," said Dean Cowan, marketing manager—specialty contact lenses for Bausch & Lomb. "Our system has options for people in all stages of presbyopia, and with the patient screening and fitting materials, we're giving the practitioner more flexibility than ever to fit presbyopes with the appropriate lens."

For further information about the Presbyopic Fitting System from Bausch & Lomb, contact your Bausch & Lomb representative or call Bausch & Lomb at 1-800-828-9030 (1-800-462-1720 in New York State; 1-800-828-6291 in Alaska and Hawaii). □

Boston® RXD™ Daily Wear Contact Lens Receives FDA Approval

Polymer Technology Corporation's BOSTON RXD, a highly durable daily wear contact lens, received final approval for marketing in the U.S. This new rigid gas permeable (RGP) lens material combines superior health and comfort benefits with precision machinability, fitting predictability and crisp, clear optics.

"BOSTON RXD is Polymer Technology's best daily wear material. Because of its matrix stabilization system and its low silicone and high fluorine content, it offers many benefits previously unavailable in a daily wear RGP," said Ronald Herskowitz, O.D., Vice President of Research & Development. "BOSTON RXD will be the new daily wear lens of choice, replacing first and second generation RGP's," he added.

BOSTON RXD features Intralok,™ a unique new intramolecular matrix stabilization system. By maintaining the dimensional integrity of the lens, Intralok provides stable lens parameters for a predictable fit and reliable optics.

BOSTON RXD's uniquely balanced formulation offers superior protection of corneal health due to increased oxygen transmissibility, wettability and deposit-resistance compared to low and moderate Dk lens materials. BOSTON RXD also contains 39% more of the patented proprietary fluorine monomer found in BOSTON® EQUALENS.® In fact, BOSTON RXD has more fluorine than any other fluorosilicone acrylate lens available.

BOSTON RXD will be sold by Authorized BOSTON manufacturers. To ensure quality and reliability, only those labs who have been able to demonstrate the capability to manufacture BOSTON RXD to exacting standards have been authorized to manufacture this lens. □

Correction:

In the article, "The Association of Optometric Contact Lens Educators," (Summer 1989), the institutional affiliation of author Lester Caplan, O.D., M.Ed., was incorrectly given. Dr. Caplan is professor and assistant dean for clinical services at the University of Alabama at Birmingham School of Optometry. *JOE* regrets the error.

Secretary's Award for Innovations in Health Promotion and Disease Prevention*

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A Strabismus Diagnosis Laboratory for The Evaluation of Concomitancy

Michael W. Rouse, O.D., M.S.Ed.
Alan Winkelstein, O.D., M.S.Ed.

Abstract

In order to bridge the gap between preclinical and clinical optometric education of students in the diagnosis of nonconcomitant strabismus, a laboratory curriculum was developed which utilized simulated nonconcomitant deviations and doctor-patient interactions. This design was felt to create a more realistic learning experience which resulted in greater student interest.

Key words: *Simulated noncomitant strabismus, evaluation of concomitancy*

Introduction

Recently we reported on a preclinical strabismus/amblyopia diagnosis laboratory experience using a simulation of amblyopia.[1] The simulation and concurrent laboratory curriculum were designed to bridge the gap between laboratory experience and the actual clinical evaluation of patients presenting with amblyopia. The laboratory instructors and students felt that this curriculum design, utilizing a simulation of the condition being investigated, created a more realistic learning experience and promoted greater student interest in achieving diagnostic procedure proficiency, rather than simply administering the tests on their non-amblyopic colleagues.

In this paper we report on the educational development of another laboratory in the strabismus/amblyopia diagnosis laboratory curriculum. This laboratory covered the evaluation of concomitancy and is the fifth in a series of seven laboratories. The concomitancy laboratory was designed with simulation features of both the vision condition and the doctor-patient interaction, which attempted to imitate the actual clinical evaluation of a strabismic patient.

TABLE 1

Listing of the different nonconcomitant conditions simulated created.

Simulator #	nonconcomitant condition (under-acting)
1	Left Lateral Rectus
2	Left Lateral Rectus
3	Right Medial Rectus
4	Left Medial Rectus
5	Left Inferior Rectus
6	Left Superior Oblique
7	Right Superior Rectus
8	Left Superior Rectus

The Simulation

A nonconcomitant strabismus simulator was created using 25pd sector Fresnel prisms.[a] Eight different spectacles were designed to create four horizontal and four vertical nonconcomitant deviations (Table 1). The simulators approximated a recent onset paresis where the deviation is confined to the diagnostic action field (DAF) of the affected muscle.[2] As an example, Figure 1a. illustrates the doctor's

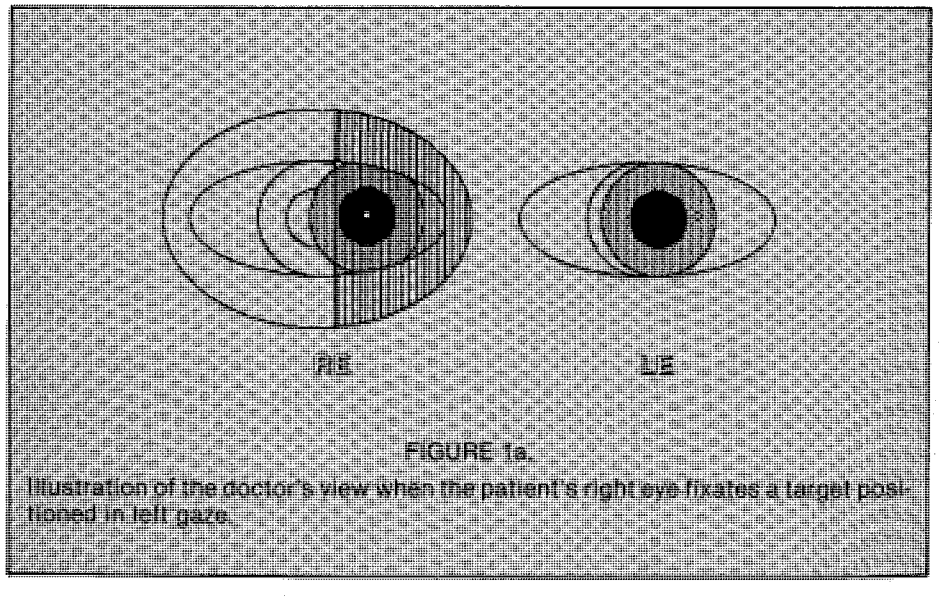

FIGURE 1a.
Illustration of the doctor's view when the patient's right eye fixates a target positioned in left gaze.

Dr. Rouse is an associate professor, lecturer/lab instructor for the course, Diagnosis of Strabismus/Amblyopia, and chief, Vision Therapy Service, at the Southern California College of Optometry.

Dr. Winkelstein is an assistant professor at the Southern California College of Optometry and lab instructor for the course, Diagnosis of Strabismus/Amblyopia.

Presented as a Poster at the 1987 meeting of the American Academy of Optometry, Denver, CO.

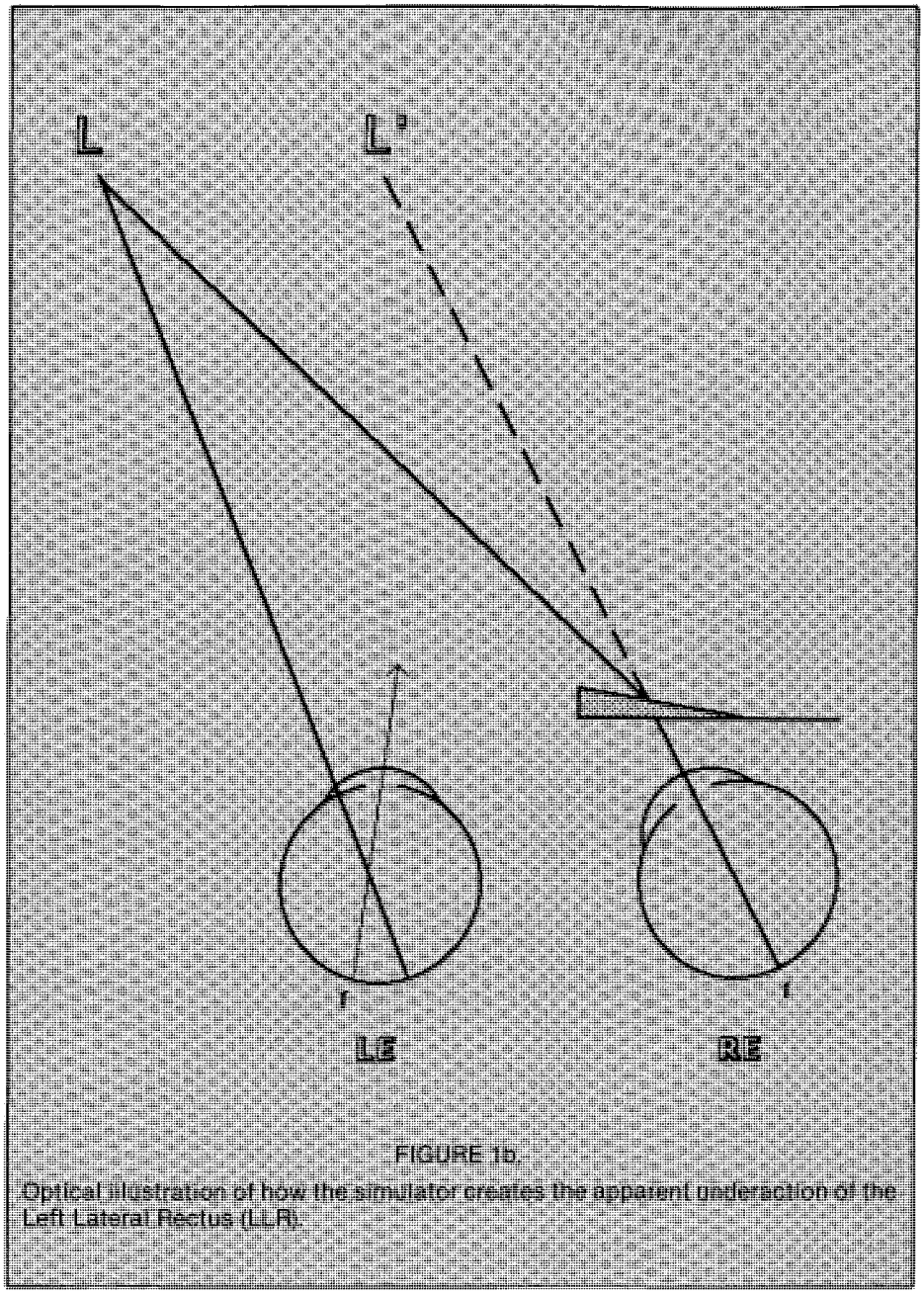

FIGURE 1b.
Optical illustration of how the simulator creates the apparent underaction of the Left Lateral Rectus (LLR).

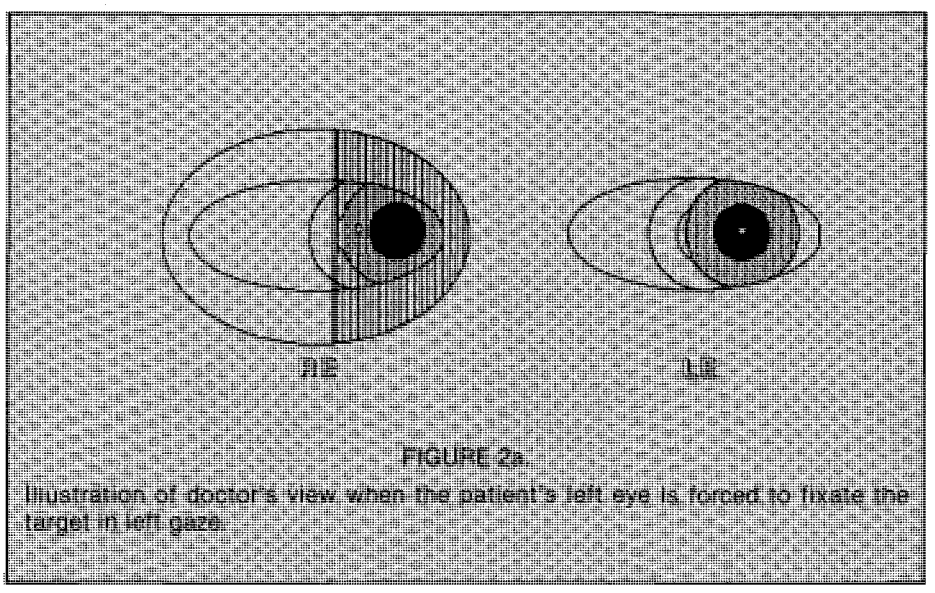

FIGURE 2a.
Illustration of doctor's view when the patient's left eye is forced to fixate the target in left gaze.

view of the patient with an apparent underaction of the left lateral rectus (LLR). Figure 1b. shows how the simulator optically creates the apparent underaction. Figure 2a. illustrates the doctor's view as fixation is forced to the apparent underacting LLR and a subsequent overaction of the right medial rectus (RMR) is observed. Figure 2b. shows how the simulator optically creates the apparent overaction. Figure 3. demonstrates the actual appearance of the simulator glasses on the patient with the patient's eyes directed in primary gaze.

There were certain limitations noted when using the simulator. First, when the doctor viewed through the high-powered Fresnel prism, two problems occurred: 1) the image clarity of the patient's eye was slightly reduced and 2) multiple Hirschberg reflexes or pupil images were often observed. These two problems made it difficult for some student doctors to observe the Hirschberg reflex displacements or eye movements on alternate cover testing. These problems were minimized by providing hints, such as adjusting room lighting intensity or making small changes in the student's viewing angle. Second, the student doctor's placement of targets (eg, penlights), often splits the edge of the prism creating multiple images and making it difficult for the patient to maintain fixation on the correct target. This problem was minimized by having the patients adjust their heads slightly to eliminate the double image. Third, unlike a true paresis, the measured magnitude of the nonconcomitancy was the same with either eye fixating (Figure 5c). This limitation was pointed out to the students at the beginning of the laboratory session. The problem will be minimized in the future by having the patient fixate through an additional hand-held prism when the affected eye is fixating, thus resulting in a greater secondary angle of deviation.

The Laboratory Curriculum

The ten-week course in Stabismus/Amblyopia Diagnosis at the Southern California College of Optometry consisted of a weekly 3 hour lecture and 4 hour laboratory. Each 4 hour laboratory session was organized into three parts: 1) a 45 minute presentation/demonstration of diagnostic techniques by the laboratory instructor, 2) a practice period of 2-3/4 hours, and 3) a 1/2 hour discussion at the conclusion of the lab to answer questions and resolve problems. The fifth laboratory session covered the diagnostic methods for the evaluation of nonconcomitant strabismus.

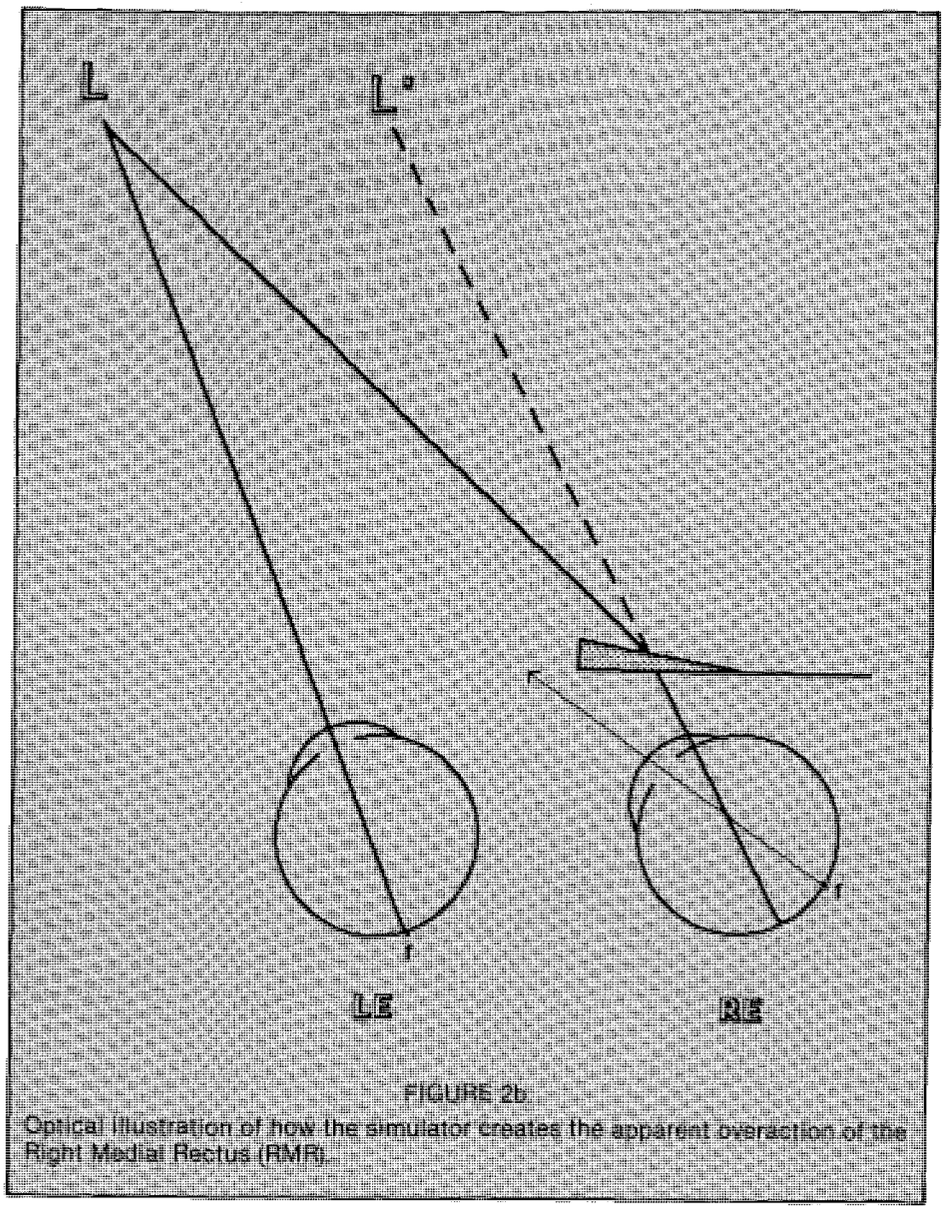

FIGURE 2b.
Optical illustration of how the simulator creates the apparent overaction of the Right Medial Rectus (RMR).

FIGURE 3.
Demonstrates the actual appearance of the simulator when the patient's eyes are positioned in primary gaze.

Three educational goals were developed for the laboratory:

1. Present and demonstrate an examination strategy for evaluating the concomitancy of a patient presenting with strabismus.

2. Provide students with a realistic practice session, utilizing simulated nonconcomitant deviations, in order to develop diagnostic procedural proficiency.

3. Provide students with an interpersonal (doctor-patient) practice opportunity in order to explain the condition of nonconcomitant strabismus.

From these educational goals, specific behavioral objectives were developed to reach observable endpoint competencies. By the conclusion of the laboratory, the student was expected to be able to:

1. Demonstrate each diagnostic technique in the following list, using the steps detailed in both the "Strabismus/Amblyopia: Diagnostic Techniques Manual,"[3] and the directions of the instructor.

A. *Objective Methods*
   i. Versions (using Hirschberg)
   ii. Ductions (using Angle Lambda)
   iii. Alternate Cover Test (with prism neutralization)
   iv. Park's Three Step Method (if vertical deviation is present)

B. *Subjective Methods*
   i. Red Lens Test
   ii. Hess-Lancaster Test

2. Demonstrate the ability to make appropriate observations and/or to achieve appropriate results with each technique by properly recording the observations and/or results according to both the instructions in the "Strabismus/Amblyopia: Diagnostic Techniques Manual" and the directions of the instructor on the Strabismus/Amblyopia Diagnostic Data Base.

3. Demonstrate and describe the condition of nonconcomitant strabismus to patient, parent and other interested parties.

The Learning Experience

Working in pairs, the students followed doctor-patient scripts (see Figure 4a. & 4b.), first, acting as the doctor and then as the patient. The patient simulated two different nonconcomitant conditions: first, a lateral muscle paresis by wearing simulator 1,2,3 or 4, and second, a cyclovertical muscle paresis by wearing simulator 5,6,7 or 8. The patient script (Figure 4a.) instructed the patient exactly how to respond (e.g., which eye to use for fixation), on each of the tests the doc-

EVALUATING THE OCULAR DEVIATION: DOCTOR

Your patient is presenting with a NONCONCOMITANT strabismus. The patient will be wearing glasses with sector Fresnel prisms to simulate two different paretic conditions. DO NOT assume that the eye behind the lens with the Fresnel prism is paretic. You should proceed through the laboratory exercise as if the patient is simply wearing their best correction. It may be slightly difficult observing what is occurring behind the Fresnel prism, but, give it your best effort! Assume the patient has equal visual acuities OD and OS. Your diagnostic task is to administer the following sequence of diagnostic procedures to evaluate the concomitancy of the ocular deviation.

1. *VERSIONS:*

   Using the Hirschberg technique, move into each of the nine diagnostic action fields (DAF's) and evaluate the Hirschberg reflex. Record what you observe. As you estimate the change in the deviation, you also attempt to describe the underoveractions you observe. If you observe only overactions, force fixation to the other eye to identify the underacting muscle. Write your description as follows: RE fixating, size of underaction (UA) (Rate on scale of -4 UA to +4 OA) of LLR in left gaze.

2. *RED LENS/MADDOX ROD:*

   Once you have grossly objectively evaluated for noncomitancy, use the Red Lens technique to subjectively confirm your suspicion. Follow the procedure in the laboratory manual and record your results.

3. *DUCTIONS:*

   When an underaction is suspected, versions should be followed up with an evaluation of ductions. Move the suspected muscle into its DAF and evaluate whether any underaction is present. It is helpful to use angle Kappa/Lambda to increase your sensitivity.

4. *ALTERNATE COVER TEST:*

   This is the best objective method for evaluating the magnitude of the noncomitancy. The method is the same as described previously for evaluating the deviation, but it is now done in each of the DAF's with either eye fixating. Do not go for 1 prism diopter differences! Look for changes of greater than 5 prism diopters. Follow the procedure in the laboratory manual and record your results.

5. *HESS LANCASTER TEST:*

   This is the best subjective method for evaluating the magnitude of the noncomitancy. Follow the procedure in the laboratory manual and record your results.

6. *PARK'S THREE STEP:*

   If you have a vertical deviation, this procedure will help you identify the underacting cyclovertical muscle. Follow the procedure in the laboratory manual and record your results.

FIGURE 4a.
Example of script followed by the student doctor during the learning experience.

EVALUATING THE OCULAR DEVIATION: SIMULATED PATIENT

You are the simulated patient presenting with a NONCONCOMITANT strabismus. The doctor is going to administer a sequence of tests to assess the concomitancy of your ocular deviation. Do not reveal your diagnostic identity until the doctor has completed the entire sequence of testing. Follow the doctor's instructions throughout the testing.

You will be simulating two different types of paretic conditions. Spectacles #1-4 simulate lateral muscle paresses; spectacles #5-8 simulate cyclovertical muscle paresses. You will probably experience diplopia while wearing the simulation glasses, however, it is imperative that you fixate the target indicated in the instructions below.

1. *VERSIONS:*

   Depending on which # spectacle you selected, fixate with the appropriate eye:

   #1: RE fixating
   #2: RE fixating
   #3: LE fixating
   #4: RE fixating
   #5: RE fixating
   #6: RE fixating
   #7: LE fixating
   #8: RE fixating

2. *RED LENS/MADDOX ROD:*

   Depending on which # spectacle you selected, fixate with the appropriate eye:

   #1: RE fixating
   #2: RE fixating
   #3: LE fixating
   #4: RE fixating
   #5: RE fixating
   #6: RE fixating
   #7: LE fixating
   #8: RE fixating

3. *DUCTIONS:*

   Since you do not actually have a paretic muscle, your ductions will be full, however, for this laboratory you will simulate a significant paretic component by doing the following: when the doctor asks you to follow the light, only follow slightly past the midline (-10 degrees), then *STOP!* For each simulation spectacle, follow the directions below:

   #1: -3 UA LE in L gaze
   #2: -3 UA LE in L gaze
   #3: -3 UA RE in L gaze
   #4: -3 UA LE in R gaze
   #5: -3 UA LE in down-left gaze
   #6: -3 UA LE in down-right gaze
   #7: -3 UA RE in up-right gaze
   #8: -3 UA LE in up-left gaze

4. *ALTERNATE COVER TEST:*

   Simply follow the doctor's instructions.

5. *HESS LANCASTER TEST:*

   Simply follow the doctor's instructions. You may see a double image through the filter over the eye with the Fresnel prism. Use the DIMMER image as the target.

6. *PARK'S THREE STEP:*

   The doctor will perform this test using simulation glasses #5-8 only. You will need to simulate an increased hyper deviation on the head tilt portion. Follow the suggestions below:

   #5: on R tilt: look through lower Fresnel portion
       on L tilt: look through clear portion of lens
   #6: on R tilt: look through clear portion of lens
       on L tilt: look through lower Fresnel portion
   #7: on R tilt: look through upper Fresnel portion
       on L tilt: look through clear portion of lens
   #8: on R tilt: look through clear portion of lens
       on L tilt: look through upper Fresnel portion

FIGURE 4b.
Example of script followed by the simulated patient during the learning experience.

tor was conducting. In addition, the patient was instructed not to reveal his/her diagnostic identity until the doctor had completed the diagnostic workup and case presentation. The doctor proceeded through the sequence of testing outlined in the doctor's script (Figure 4b.). The doctor was instructed to accurately record his/her results and observations on the diagnostic data base. For immediate feedback a key was available which showed the correct results and "suggests" on each diagnostic test. In addition, the diagnostic data base recording form was handed in at the conclusion of the laboratory and reviewed by the instructor who added constructive comments on the recording accuracy and clarity. The form was returned to the student at the next laboratory session.

Figures 5a, b & c provide an example pictorial overview of the student's learning experience, showing the doctor/patient instructions, the diagnostic procedure and the recording of results and observations for the Hess Lancaster Test.

Student Reaction

The students felt the simulation served to increase their awareness of the problems faced by patients with nonconcomitant strabismus, such as uncomfortable head positions, diplopia and nausea. In addition, the students felt the laboratory provided a more realistic learning experience than simply administering the diagnostic procedures on their nonstrabismic colleagues.

Conclusions

This laboratory curriculum provided students preclinical practice evaluating simulated nonconcomitant strabismus. The simulation created a more realistic learning experience and developed greater student interest toward learning important diagnostic procedures. □

The authors would like to thank Catherine Heinrich and Jeffrey Kramer for their assistance and Richard Morrison for the photographic work.

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Footnotes:

a. Fresnel Prism & Lens Company
Route 1—Box 298-3
Siren, Wisconsin 54872
(715) 349-2638

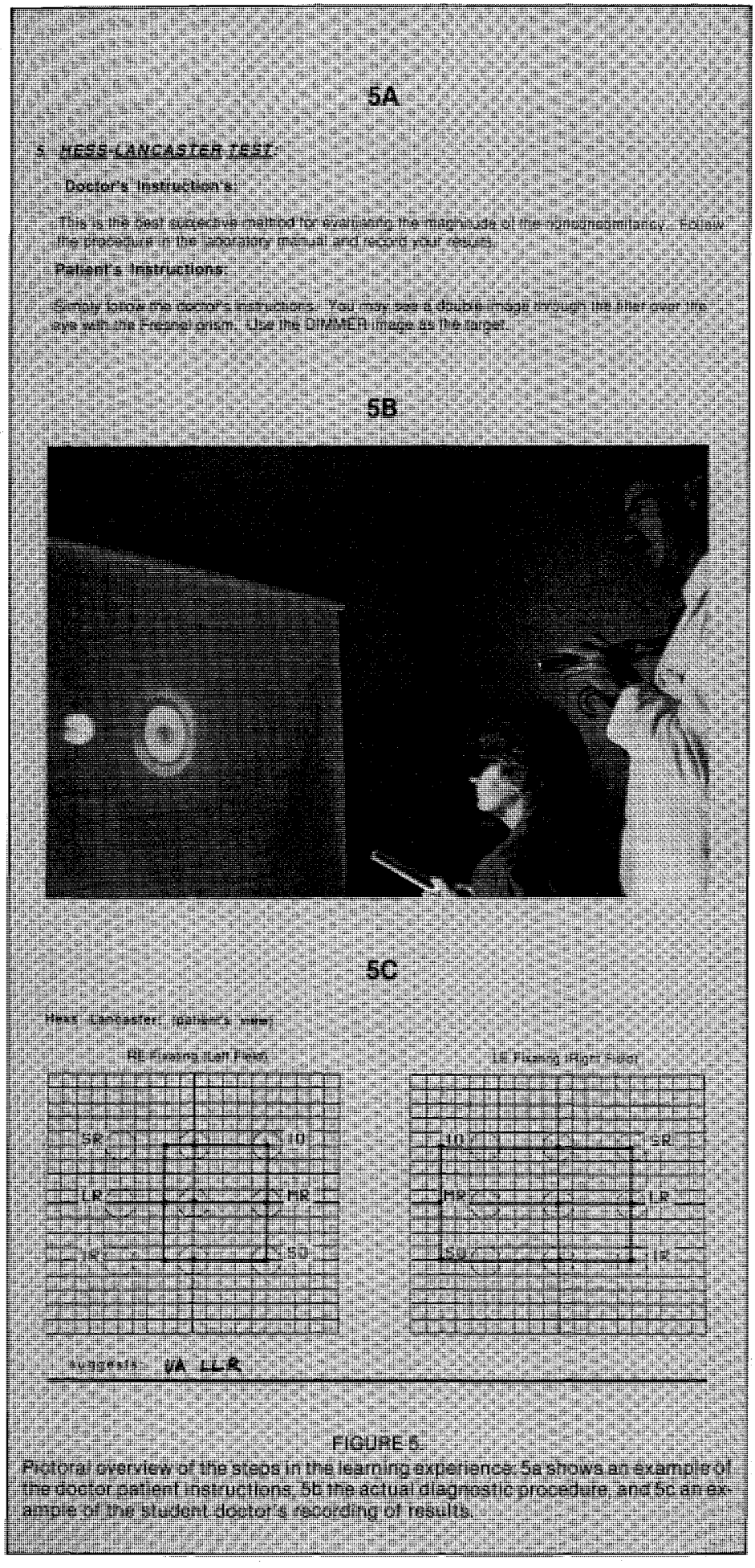

FIGURE 5.
Pictoral overview of the steps in the learning experience. 5a shows an example of the doctor patient instructions, 5b the actual diagnostic procedure, and 5c an example of the student doctor's recording of results.

High Test Reliability: Cause for Celebration or Concern?

Jack E. Terry, O.D., M.S.
Leon J. Gross, Ph.D.

Abstract

This article discusses a subtle dilemma. The reliability of test results, like many statistics, is guided by the notion of "higher is better." This article discusses a test based on a continuing education course in which high test reliability was not a virtue. Instead, the high reliability was a subtle indicator of an underlying problem with some of the material being tested. The implications of this situation are examined.

Key words: *continuing education, test reliability*

Introduction

One of the most important statistical qualities of test results is the reliability index. The most commonly used reliability statistic is the Kuder Richardson 20 formula (KR-20). This statistic estimates the internal consistency or replicability of the test results, quantifying the degree of agreement that would result if the same test could be administered to the same candidates under the same conditions. In other words, the KR-20 index correlates each person's score with itself.

High levels of reliability have traditionally been regarded as inherently virtuous. However, in discussing the emergence of criterion-referenced measurement, Popham and Husek[1] pointed out that the results of instructional tests should neither be required nor expected to have a high level of reliability. Similarly, they added that the component test items should not be expected to be very discriminating, and furthermore, a particularly discriminating item may reflect an instructional deficiency. More recently, high reliability indices have been challenged, as potentially indicative of an underlying problem with the test or the examinee population.[2] This article is about such an occurrence.

Reliability is closely related to the length of a test. The greater the number of items, the more reliable a test is likely to be. Reliability is also related to the variability of test scores. The more variable the distribution of scores, the higher the reliability. Reliability indices for credentialing examinations such as those of the National Board of Examiners in Optometry are recommended to be at a high level; that is, .90 or higher.[3] In order to attain reliability levels of this magnitude, procedures are available, such as the Spearman Brown Prophecy Formula, to calculate the number of test items needed.

Demands on the magnitude of reliability are not as great for progress and course examinations. These examinations typically are less comprehensive in scope, and therefore are shorter. Similarly, since the examinees have presumably been exposed to the same material, the distribution of their test scores should be relatively narrow. These factors would suggest relatively modest levels of reliability.

Consider the test for a continuing education (CE) course in which the reliability index is surprisingly high. Should this be a cause of concern? This article describes such a situation, and discusses why the high reliability was justifiably a cause for concern rather than celebration. Other CE instructors may find themselves in a similar assessment dilemma.

Method

One of the authors was invited to deliver a 10-hour CE course on ocular inflammation, immunology, and allergy. The course was given in February 1988 to 180 practicing optometrists in Florida, and required that a multiple-choice national board-type examination be administered. The test was given as a "take home" examination, and was to be returned to the sponsoring optometric institution for statistical analysis.

Eight of the items in the test covered the pharmacology of diagnostic drugs. These questions were expected to be very easy, since it could be assumed that the attendees were already very experienced in the use of drugs for these purposes. These items were, therefore, regarded as testing *assumed* knowledge. The balance of the items (52 of 60) were based on specific course content.

The instructor felt compelled to include this type of question despite *not* discussing diagnostic drugs in the course because the Florida Board required that *at least* 75% of the test items cover pharmacology. This was a major concern since the majority of the course was not specific pharmacology, but rather, the basic principles of inflammation, immunology, and allergy. The final test consisted of 60 multiple-choice items. Each item contained four options, one of which was correct.

Results

The tests were scored by the Bureau of Evaluative Studies and Testing for the

Dr. Terry is chief of the optometry section and director of hospital-based optometric residencies at the Huntington, West Virginia Veterans Administration Medical Center. Dr. Gross is director of psychometrics and research at the National Board of Examiners in Optometry in Washington, D.C.

More recently, high reliability indices have been challenged, as potentially indicative of an underlying problem with the test or the examinee population. This article is about such an occurrence.

Indiana University School of Optometry. There were 120 examinees, representing 67% of those who attended the course. After the tests were *initially* scored and analyzed, three items were deleted because of test construction flaws. One of the deleted items was among the eight items that tested assumed knowledge. The other two deleted items were among the 52 items that related to course material. The tests were then rescored, based on 57 items.

The summary test statistics are displayed in Table 1. The test seemed to the examinees to be more difficult than similar examinations they had taken after previous courses in this lecture series. This perception appeared related to eight of the items having covered material that was not in the lecture or handout. However, the overall mean score was relatively high at 86.2%. Since the average percentage of correct responses per item (i.e., average difficulty index or p-value) is always mathematically equal to the average examinee score, the average item p-value was also 86.2. In comparison with National Board pharmacology test results, which typically have an average p-value of 70-75, the average p-value of 86.2 on the CE test was high.

Items that are relatively easy for an examinee population are not expected to have high discrimination. This is due to candidates of varying achievement levels, as measured by the total test score, performing at about the same level on the item (i.e., answering correctly).

The statistical index of discrimination used for this examination was the point biserial correlation (known as the RBPI, or r-value). A low average r-value suggests a lack of distinctiveness among examinees, and would be expected to, in large part, produce a relatively low KR-20 reliability. Surprisingly, for the CE examination results, the reliability was .74. This level was much higher than expected, since the test was fairly short and empirically easy. This implied that item discrimination levels were relatively high, despite the items being easy, further suggesting that some examinees were consistently "missing" items, potentially because for these individuals, no learning had taken place. Therefore, rather than regarding this surprisingly high reliability as a virtue, the authors felt that it was masking a problem.

In order to better understand the source of the high reliability and hence, high item discrimination, the 57 scored items were divided into two groups. The first group consisted of the seven items testing knowledge of diagnostic drugs. These items tested assumed knowledge that was not covered in the course. The second group of items consisted of the 50 items that covered therapeutic drugs, and which were the focal point of the course.

These two groups of items were analyzed separately to assess their effect on the test results. These data are summarized in Table 2. As these data indicate, despite covering advanced material, the therapeutic drug items were empirically easier (average p-value of 88.1)

TABLE 1
Summary Statistics of Test

Number of examinees	120
Number of test items	57
Range	34-56 (59.7%-98.3%)
Mean	49.1 (86.2%)
Median	49.1 (86.2%)
Mode	49.0 (86.0%)
Standard deviation	4.36
KR-20 reliability	.70

TABLE 2
Comparison of Test Items and Examinees

Item Type	Number of Items	All Examinees	Upper Third	Lower Third	Mean Discrimination (All Examinees)
Diagnostic (assumed)	7.9	89.7	66.0	.30	
Therapeutic (taught)	50	88.1	96.1	79.9	.23
TOTAL	57	87.0	95.4	78.3	.24

The significance of these findings is that there was a greater spread or heterogeneity among candidates on the items testing assumed knowledge, than for the material covered in the course.

than the seven diagnostic drug items (average p-value of 77.9). The discrimination indices of both groups of items were subsequently analyzed. The average RPBI of the seven diagnostic drug items was .30, while the average RPBI for the therapeutic drug items was .23. These data indicate that the items testing assumed knowledge were more difficult and more discriminating than the items aligned with the course material.

One further set of analyses was conducted. The purpose of the additional analyses was to determine whether the greater difficulty and discrimination of the items testing assumed knowledge resulted from an equal depression of performance across the entire candidate population, or whether it was more attributable to high or low performing examinees.

The results of this analysis are also summarized in Table 2, and are based on the average performance of examinees in the upper and lower thirds of the test score distribution. These data indicate that performance on the diagnostic drug items was lower for both the upper and lower thirds of the distribution, but that the performance decrease was worse among the lower third of the candidates. The performance breakdown by thirds is depicted in Figure 1. The rectangles for the items testing assumed, taught, and total material are divided into upper and lower portions which correspond to the aforementioned upper and lower thirds.

The significance of these findings is that there was a greater spread or heterogeneity among candidates on the items testing assumed knowledge, than for the material covered in the course. The effect of these seven items was to make the examination more difficult and more discriminating. Ultimately, this effect served to artificially inflate the reliability of the test results.

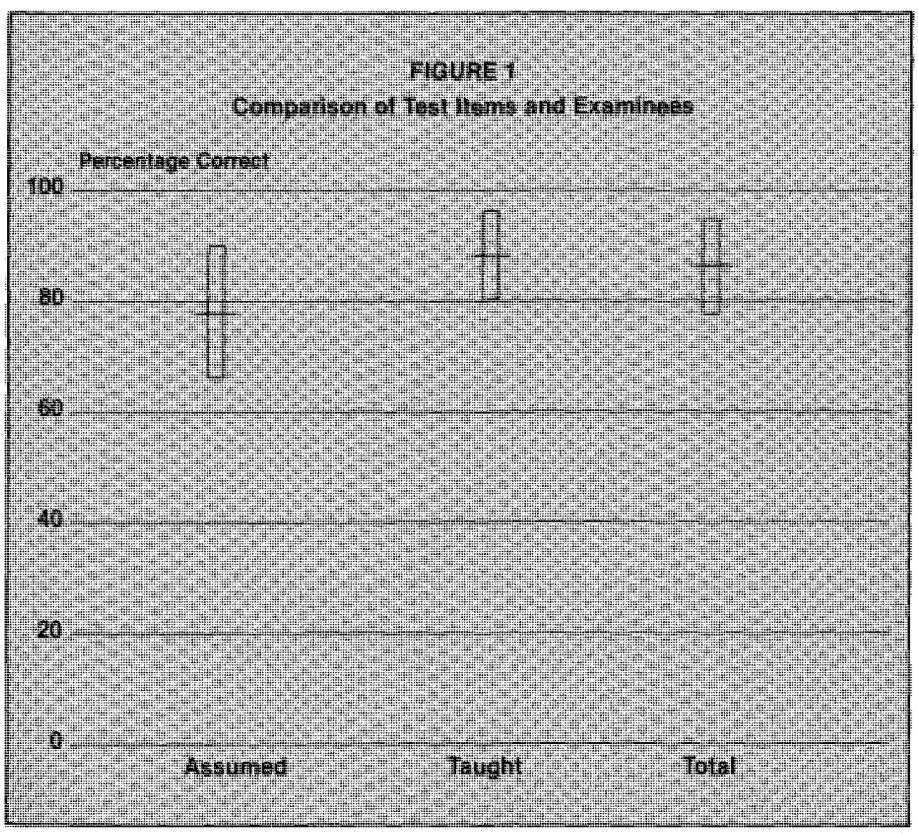

FIGURE 1
Comparison of Test Items and Examinees

Conclusions

High test reliability is usually considered to be a virtue. This article describes how the reliability index can serve as a diagnostic statistic when it appears higher than one would expect, based on test length and the examinee population.

In the CE course examination described in this article, the high reliability was the result of test items that were not congruent with the course content. The presence of such items on an examination can artificially inflate the reliability, and similarly, artificially inflate the failure rate. The high reliability in this context is particularly insidious because it suggests that the relatively high failure rate is valid.

The solution to this problem is simple. Examinations should be limited to testing course material. However, if evaluation of prerequisite material is deemed important, examinees should be duly informed so that they may prepare adequately. Alternatively, the instructor can administer a pretest to assess prerequisite information. The results would dictate whether a short review is necessary, before new material is given.

Regardless of the strategy utilized, the CE test results may be less reliable. However, more importantly, their validity is likely to be higher. □

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FACE-TO-FACE

JERRY L. CHRISTENSEN, O.D., Ph.D.

Jerry L. Christensen, O.D., Ph.D., was recently installed as ASCO's twenty-second president. In an interview with JOE managing editor Patricia C. O'Rourke, Dr. Christensen talked about his experiences in optometric education and his goals for the Association.

Dr. Christensen, how long have you been dean of the University of Missouri-St. Louis School of Optometry?

I have been dean since the school began on June 1, 1980. Prior to that I was chairman of the Department of Physiological Optics and director of graduate programs at the University of Alabama at Birmingham. Following completion of the optometry program and a Ph.D. in physiological optics from The Ohio State University, I went to the then Massachusetts College of Optometry (now the New England College of Optometry) in 1969 as an assistant professor and then to UAB in 1973.

In addition to your formal education, what other factors influenced you to pursue an administrative career?

Hank Peters, former dean of the University of Alabama at Birmingham School of Optometry, urged me to apply for an American Council on Education Fellowship. Hank played a major role in my obtaining the fellowship which I completed in 1975-76. Since early in my career I have valued the importance of teaching; an administrative position gives me a chance to influence education more broadly.

What concerns have you focused on as dean?

I have attempted to develop a solid educational program and provide the faculty with an environment that will foster their teaching and research activities. The first six years of our program I spent a good deal of time with architects; something was always under construction. Establishing the policies needed for the School has also been a constant task. Putting into place all the elements needed for a graduate program and successfully negotiating the approval process has also taken time and effort (our program should start in 1990). Also I have focused on our clinics; finding the correct balance of our clinics' patient-care, educational and business aspects is a special challenge.

Personally, I will feel gratified if my two-year presidency in some way improves optometric professional education. The key word is change.

What has been your major achievement as dean?

Surviving and keeping my sense of humor. On a less personal level, I have seen our program expand from a single office in Woods Hall to an attractively remodeled four-story building with a well-equipped library; sophisticated research laboratories and an off-campus clinic, the Optometric Center. We look forward to the proposed East St. Louis Clinic.

Outside the school, participating in successful legislative efforts to bring both DPA and TPA legislation to Missouri was satisfying.

A particular joy is encountering successful alumni who appreciate and value the education provided by our program.

What are your goals for ASCO as you begin your term as president?

I am committed to seeing our organization accomplish even more of the activities forming our strategic plan. So far our efforts have been directed to student recruitment, defining the scope of optometric education, and curricular development. These activities must be continued and others, such as faculty development, the collection of data on our programs, and serving as a Washington window, need attention.

Personally, I will feel gratified if my two-year presidency in some way improves optometric professional education. The key word is change. Our educational institutions are facing some enormous challenges: the declining applicant pool; the increased scope of optometric practice and the necessary changes in our programs; operating a clinical program in today's competitive market; increasing critical thinking in our educational process; the development of new faculty by means of residency programs, graduate programs, or some combination thereof. Many of the long-standing ways of doing things in our schools and colleges need evaluation and change.

What do you think about optometry's commitment to research?

This is a complex issue. I don't think commitment is the problem. First of all, there is quite a bit of research done by the faculty of our schools and colleges. What needs to be increased is our federally-funded research. Furthermore, I think it is predominantly the clinical areas that are low in National Institutes of Health funding—low compared to ophthalmology. Our basic and visual scientists do have reasonable NIH support.

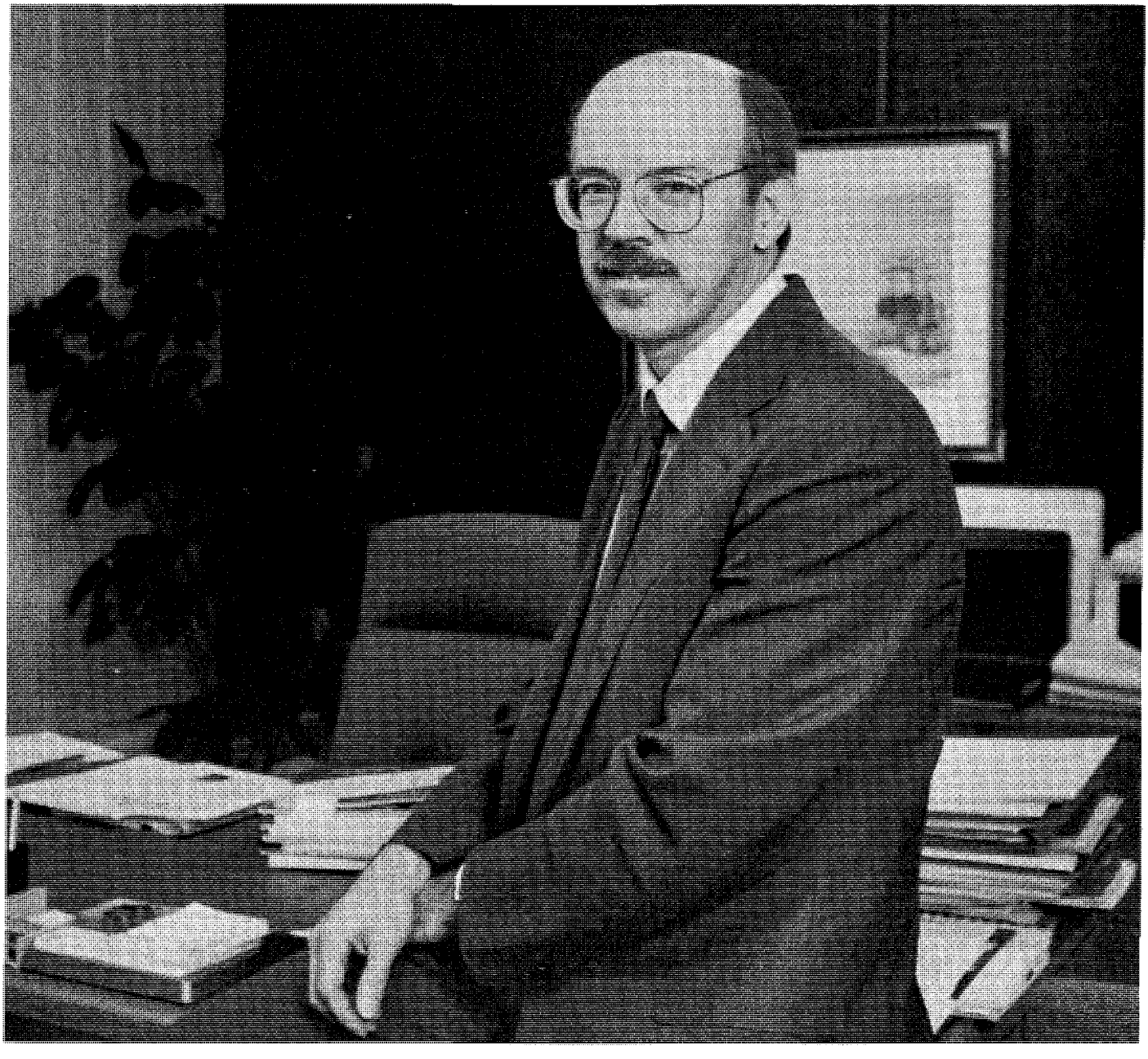
What are the reasons for this dearth of federally-funded research in clinical areas? Several explanations are suggested: 1) it is rare for any of our faculty to have no teaching assignment, yet medical schools have a significant number of faculty who are exclusively researchers; 2) residencies in ophthalmology have a substantial research component increasing the likelihood that academic ophthalmologists will become involved in formal research; 3) opthalmology has been involved in a number of heavily-funded clinical trials while optometry is just beginning to see the potential of these activities; 4) the changes in our profession have put stress on the faculty and the educational enterprise resulting in federally-funded research being a low priority—particularly with our clinical faculty; 5) there is little precedent or tradition in optometry of pursuing federally-funded clinical research—this is not something we expect of our faculty—again, unlike ophthalmology; 6) departments of academic medicine have long "directed" research, that is, they hire Ph.D.'s to do specific research, research of clinical importance. I do not see our programs doing this to any great extent.

In general, we approach research more like college of arts and sciences' departments than like medicine or dentistry, and that works against us.

What about your personal goals?

Other than continuing to do my best as dean and president of ASCO, I would like to do some writing in the area of optometric history. The International Library, Archives and Museum of Optometry is a great resource here in St. Louis. I would like to write a book on the history of optometric education in the United States. □

photo by Marilyn Zimmerman



The Kolb Learning Styles Inventory

Predicting Academic Potential Among Optometry Students

Bernard I. Sparks, III, M.S., O.D.

Abstract

The purpose of the study was to determine if the Kolb Learning Styles Inventory could be used in the recruitment process of optometry students. The specific objective was to evaluate the instrument as a predictor of academic potential. Two groups of high- and low-achieving students, as defined by cumulative grade point average, were evaluated. Distinctive learning preferences were observed between the groups but the correlations were not strong enough to support the instrument as a sensitive measure of academic potential. The important ramifications of the study, as well as potential threats to its validity, are discussed.

Key words: *learning styles, Kolb Learning Styles Inventory*

Introduction

Over the past decade, the practice of optometry has undergone unprecedented change. This expansion in the scope of the profession has had a profound impact upon optometric education. As a result, extensive revisions have been made in didactic and clinical coursework. Such upgrading is essential if the demands for greater competency among optometrists are to be met.

Concurrent with these advances have been changes in the area of student recruitment. Competency in the field of clinical practice begins with successful acquisition and application of principles presented in the classroom. In order to identify students with high academic potential, innovative selection methods should periodically be assessed for their usefulness in the recruitment process. One such method involves analyzing the learning styles of potential students. If significant differences in learning styles can be measured, this additional information may assist admissions committees in the selecting of applicants who are best suited for a given educational program.

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In order to investigate the potential of this technique in optometry, a study was undertaken using the Kolb[1] Learning Styles Inventory (LSI). The specific objective was to determine if the instrument could provide a significant distinction between learning styles of high and low achievers as defined by cumulative grade point average.

Theoretical Framework

Kolb[2] developed his learning schema by expanding upon the theory that experience is the best teacher. His concept, which embraces the philosophies of earlier educational theorists, centers around a sequential process of experiential learning. He postulates that in the course of life individuals undergo three distinct phases of development which he labels: acquisition, specialization, and integration.

The phase of acquisition begins early in life as a person develops fundamental learning strategies. These abilities are evidenced by a preferred learning style. As these learning skills are refined and enhanced, the person enters Kolb's phase of specialization. During this time, vocational aspirations and personal interests tend to become more focused. Learning often takes on new dimensions as maturity influences the person's perception of the educational process. This phase typically begins in the teen years and extends into middle adulthood. Finally, his model anticipates a redirecting of interests, ambitions and goals in later life. This phase of integration extends into the retirement years where the absence of work responsibilities opens new channels for self-expression and self-fulfillment. During each of these developmental phases, Kolb theorizes that learning occurs as a

Dr. Sparks is director of externships at the Southern College of Optometry.

continuous, sequential cycle of feeling, watching, thinking and doing.

The Learning Styles Inventory is Kolb's means of qualifying learning preferences during each of the three phases of development. His instrument identifies four specific learning patterns which he has labeled accommodators, assimilators, convergers and divergers. Each of these styles exhibits a blend of four learning characteristics: feeling (Concrete Experience), watching (Reflective Observation), thinking (Abstract Conceptualization) and doing (Active Experimentation).

Kolb defines accommodators as exhibiting a preference for concrete experience (CE) and active experimentation (AE) in the learning process. They appear to learn best when the situation involves "hands on" training and a need for intuitive feeling rather than logical evaluation.

By contrast, the learning style of assimilators tends to draw heavily upon reflective observation (RO) and abstract conceptualization (AC). Most frequently, the logical soundness of an idea is more important to an assimilator than is the practical application. Individuals with this learning style are less people-oriented and more likely to spend time "lost in tought."

Convergers are characterized as learning best from a blend of abstract conceptualization (AC) and active experimentation (AE). They tend to focus, i.e., converge, on the best answer for a given problem or task. Their strength lies in the ability to implement theory into practical applications. Kolb views convergers as relatively unemotional and less comfortable in working with people.

Divergers appear to learn best when the task or problem requires an adaptation of a previous concrete experience (CE). Unlike a converger, the diverger will evaluate problems from several perspectives before arriving at a definitive answer. Divergers are usually quite imaginative and tend to enjoy interacting with people.

Although these learning styles have been observed in students from various health care disciplines, the purpose of this study was to apply the LSI within optometry. In evaluating the data, the null hypothesis was assumed. No statistical differences were expected in the distribution of the learning styles of the subjects. Additionally, no significant differences were expected in correlations performed between cumulative grade point average and the subscale scores comprising the LSI.

TABLE 1
Demographic Comparison of Sample Population

I. High Achievers	
Sex	**Mean G.P.A.**
Males (N = 26)	3.62
Females (N = 11)	3.75
II. Low Achievers	
Sex	**Mean G.P.A.**
Males (N = 23)	2.17
Females (N = 11)	2.08

Methods

For the purpose of the study, subjects were divided into two groups. High

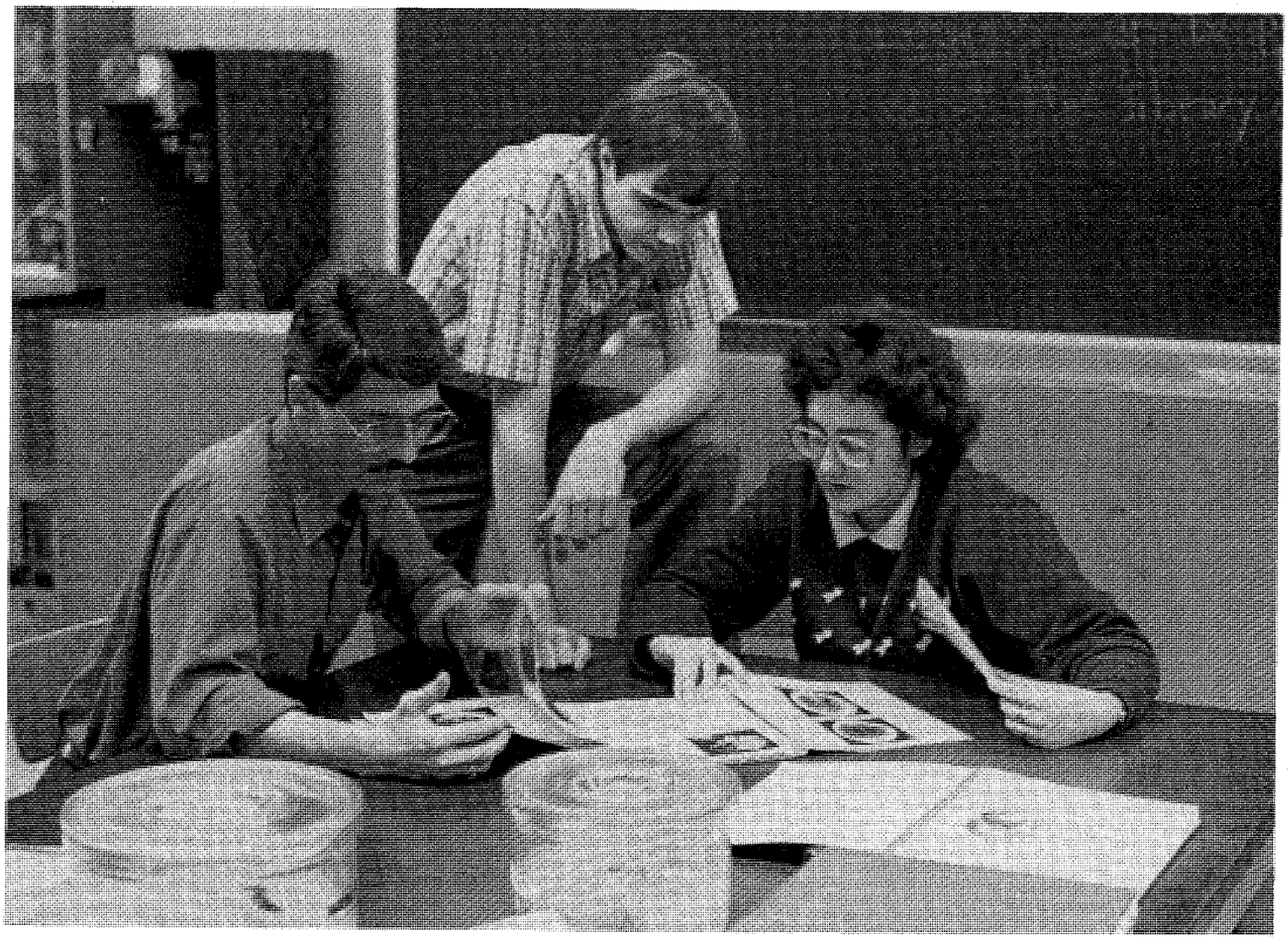

TABLE 2

Classification of Learning Styles

I. High Achievers

Style	Number of Students	Percentage
Converger	8	21.62
Diverger	4	10.81
Assimilator	17	45.95
Accommodator	8	21.62

II. Low Achievers

Style	Number of Students	Percentage
Converger	15	44.12
Diverger	3	8.82
Assimilator	9	26.47
Accommodator	7	20.59

TABLE 3

Pearson Correlations Between Grade Point Average and Subscale Scores

I. Assimilators

Subscale	Correlation	Probability
Concrete Experience	-.3735	P = .06
Reflective Observation	.5536	P < .01
Abstract Conceptualization	.3375	P = .09
Active Experimentation	.3140	P = .12
Active Learning	-.3968	P = .04
Abstract Learning	.0707	P = .73

Convergers

Subscale	Correlation	Probability
Concrete Experience	-.5355	P < .01
Reflective Observation	.0645	P = .70
Abstract Conceptualization	.5232	P = .02
Active Experimentation	-.2704	P = .21
Active Learning	-.2305	P = .29
Abstract Learning	.5854	P < .01

achievers were classified as students with cumulative grade point averages of at least 3.40. Low achievers were defined as students with cumulative grade point averages of 2.25 or less. Ninety-one percent of the sample population (71 students) agreed to participate in the study. Table 1 summarizes the demographic distribution of the two groups. With one exception, male and female students from the first, second, third and fourth year classes were represented in both groups. No female subjects were represented in the sub-category of fourth year low achievers.

The test instrument was distributed to the subjects and completed voluntarily during the third quarter of the academic year. Written consent was obtained from each subject prior to the acquisition of information pertaining to cumulative grade point averages. Because of confidentiality, no attempt was made to classify the seven students who chose not to participate.

Although different learning styles inventories have been developed, the Kolb LSI was selected for several reasons.

First, the instrument is a short survey which is easy to administer and interpret. The LSI consists of twelve statements with four possible responses. The responses are rank ordered relative to the individual's perception of how he/she learns best. Four subscales are derived and they are combined to form two bipolar axes which, when plotted on a graph, intersect at a subjective point of preferred learning. The axes represent points of interaction between active (AE-RO) and abstract (AC-CE) learning.

Secondly, the reliability of the instrument has been established. Ferrell[3] reports the test-retest reliability of Kolb's instrument to be between .30 and .71 during an analysis of several learning styles inventories. This reliability is comparable to her assessment of two other instruments which are frequently used at the college level: The Johnson Decision Making Inventory (Cronbach alpha: .30-.70) and The Dunn Learning Styles Inventory (Hoyt ANOVA: .20-.93). This supports Curry's[4] finding of an average test-retest reliability of .58. Although the investigations by Fox[5] and West[6] question the construct validity of the LSI, it continues to be one of the most widely utilized testing instruments.

Finally, from the standpoint of surface validity, the LSI appears appropriate for evaluating the basic learning skills which are crucial for success in the optometric curriculum. Optometry students are routinely challenged to perform diagnostic procedures, analyze the findings and clearly communicate various modes of therapy during the management of their patients. These aspects of clinical practice are reflected in the instrument's measurements of thinking, feeling, watching and doing.

Results

Nearly 46 percent of the high achievers were classified as assimilators. By contrast, 44 percent of the low achievers were classified as convergers. Table 2 illustrates the relative distributions within the two groups. Although the data indicates a skew in the distribution of learning styles, Chi-square analysis was not appropriate due to the small number of divergers ($N < 5$).

Pearson correlations (two-tailed test of significance) were performed between cumulative grade point average and the six LSI subscales. Three comparisons were significant and are listed in Table 3. At an alpha level of .01, the null hypothesis was rejected. For assimilators, a moderate positive correlation was noted between GPA and scores for reflective observation. For convergers, a moderate positive correlation was observed between GPA and abstract learning while a moderate negative correlation was noted between GPA and concrete experience.

The data in Table 4 illustrates these significant contrasts. Low-achieving convergers scored 31 percent higher than high achievers in the area of concrete experience while scoring 96.1 percent

lower in the area of abstract learning. High-achieving assimilators scored 19 percent higher than the low achievers in the area of reflective observation. The disparity between the assimilator scores for active learning was not significant at an alpha level of .01.

Discussion

While a review of the literature reveals that the LSI has not been researched within optometry, it has been extensively utilized in other health care sciences. Applications within medicine have been in the areas of career choice, continuing education and adaptability to alternative learning environments. Thus far, the results have been inconclusive. Plovnick[7] utilized the LSI with medical students and found an association between their learning styles and the degree to which they were influenced for or against certain specialties. Wunderlich and Gjerde[8] performed a similar study and found no significant association between learning style and medical career choice. Their conclusion is supported by Christensen[9] et al who found no significant differences when using the LSI to evaluate physicians and their preferences in continuing medical education.

In a study involving pharmacy students, Garvey[10] et al evaluated several different areas with the LSI. Among other results, a significant relationship was found for predominate learning style and grade point average. Over fifty percent of the pharmacy students were characterized as convergers.

The fact that 69 percent of the subjects in this study were classified as convergers or assimilators was consistent with previous research among health care disciplines. While Kolb views individuals with these learning styles as less people-oriented, their problem solving skills appear to be well adapted to the analytical aspects of optometry.

In summary, the results of the study provide a reference point for future research into the use of the Kolb Learning Styles Inventory in the recruitment process of optometry students. Although trends were observed between GPA and specific subscale scores for both assimilators and convergers, the correlations were not strong enough to support the instrument as a sensitive measure of academic potential.

Until further research is undertaken, the results of the study must be viewed with caution. The relatively small number of subjects limits the statistical reliability of the findings. Additionally, the learning styles and levels of success of the subjects may have been influenced by the number of years within the curriculum or by other factors within the educational setting from which they were drawn. Future studies utilizing a multi-factorial design and involving more than one school of optometry may provide a more definitive assessment of the instrument as an indicator of academic potential.

TABLE 4

Comparison of Average Scores on LSI Subscales

I. High G.P.A. Convergers

Subscale	Average	S.D.
Concrete Experience	17.38	4.21
Reflective Observation	25.13	4.08
Abstract Conceptualization	40.13	5.67
Active Experimentation	37.63	3.81
Active Learning	12.50	4.77
Abstract Learning	22.75	6.03

II. Low G.P.A. Convergers

Subscale	Average	S.D.
Concrete Experience	22.87	3.90
Reflective Observation	24.20	3.27
Abstract Conceptualization	34.47	4.49
Active Experimentation	38.67	1.49
Active Learning	14.47	3.46
Abstract Learning	11.60	7.61

III. High G.P.A. Assimilators

Subscale	Average	S.D.
Concrete Experience	16.29	4.27
Reflective Observation	32.53	4.34
Abstract Conceptualization	38.88	6.27
Active Experimentation	32.24	3.25
Active Learning	-0.29	4.60
Abstract Learning	22.59	6.87

IV. Low G.P.A. Assimilators

Subscale	Average	S.D.
Concrete Experience	19.56	3.62
Reflective Observation	27.33	3.20
Abstract Conceptualization	42.78	5.79
Active Experimentation	30.22	3.71
Active Learning	5.56	8.13
Abstract Learning	20.56	8.91

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The Case for a National Center for Health Professions Education Research*

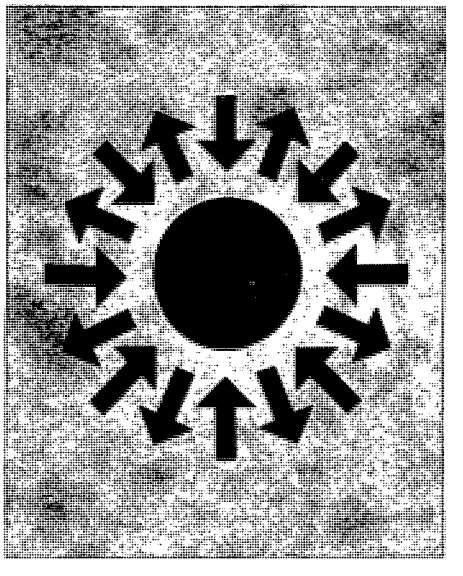
Steven A. Wartman, M.D., Ph.D.
Patricia S. O'Sullivan, Ed.D.

Abstract

Overall concerns with the health care system have raised important questions concerning educating health professionals. The need to study and perhaps alter the assumptions of this education has been raised, but data on which to base programmatic change have not been generated, since neither the assumptions nor proposed educational innovations have been adequately tested. A national center for health professions education research is proposed to facilitate well-funded, peer-reviewed, and academically credible research in health professions education. The goals of the center would allow for the testing of models to provide physicians and other health professionals with education grounded in sound methodology and content. Acad. Med. *64(1989):295-299.*

The Need for Health Professions Education Research

Our public health system is said to be in disarray.[1] There appear to be increasing numbers of complaints about our health care establishment at all levels, from patient to professional.[2] The popularity of health-related careers may be declining.[3] Concerns with health care costs have become paramount.[4] In earlier turbulent periods, reports focused on the appropriate education of our health care professionals as a means of addressing such issues.[5,6] Not only have the innovations and changes in health education generated by these reports been minimally evaluated from an educational research perspective, it is also apparent that to a large degree the situation has remained unchanged.[7]



A variety of more recent reports have called for fundamental changes in medical education. The *Journal of Medical Education* devoted much of one issue addressing the concerns of teaching in medical schools.[8] An issue of *Health Affairs* has called for medical education reform.[9] The widely circulated GPEP Report offered new directions for medical education.[10] The suggestions of these reports and papers, as well as others, beg for testing and experimentation. It is time to undertake such work in a serious, systematic, and rigorous fashion.

It is not that such educational research does not exist. In fact, there is a growing body of knowledge, much of it found in the education and psychology literature, that could be a great resource for medical educators directed toward it. Unfortunately, it has been noted that 72% of medical educators never look at the *Journal of Medical Education* and over 90% never review the major educational research journals.[7] It is not that the questions are unresearchable. For example, Norman proposes that educational research answer some rather fundamental questions involving the relationships between clinical performance and patient outcomes and between teaching methods and clinical competence.[11] He also suggests studies of the important predictors and determinants of clinical performance. Dinham and Stritter list some specific issues that need to be addressed, including what is meant by "effective" practical instruction, what clinicians need to master before entering the practice world, and what the relationship between current medical education and the health needs of the population is.[12]

Some might argue that such research in health education is simply not useful. This perspective may be attributable in part to the perception that existent studies are weak, limiting the impact of such re-

Dr. Wartman is director and Dr. O'Sullivan is program evaluator, Division of General Internal Medicine, Rhode Island Hospital, Providence, Rhode Island; Dr. Wartman also is associate professor of medicine and community health, Brown University Program in Medicine, Providence, Rhode Island

Correspondence and requests for reprints should be addressed to Dr. Wartman, Division of General Internal Medicine, Rhode Island Hospital, 593 Eddy Street, Providence, Rhode Island 02903.

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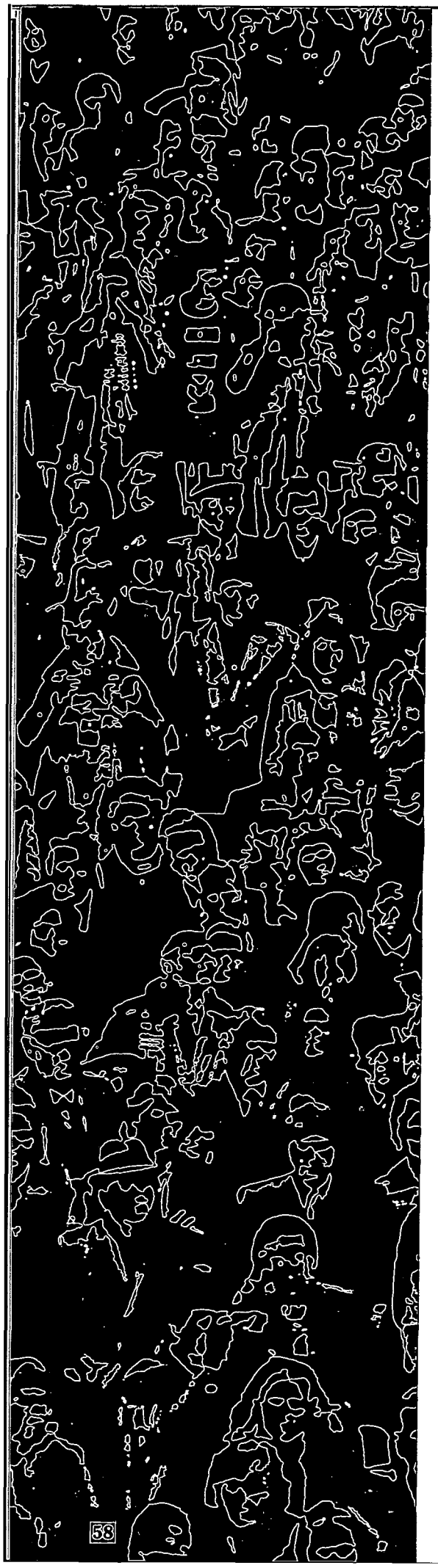
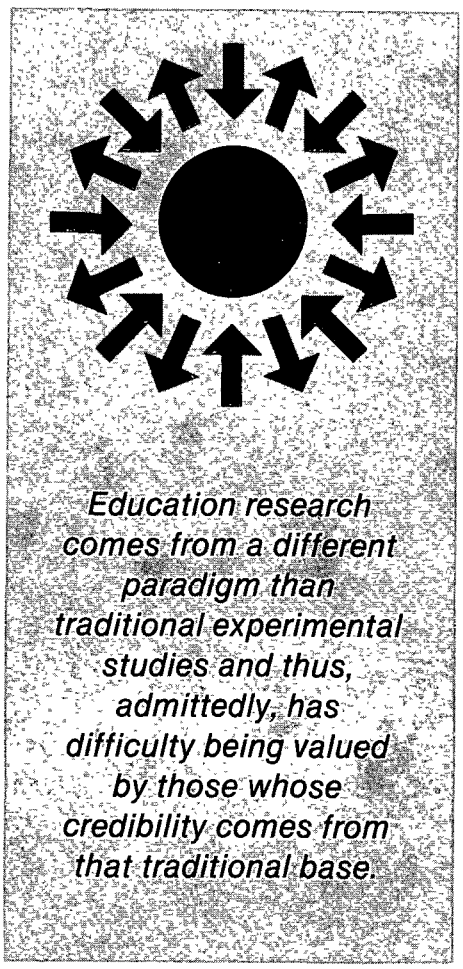


search. Regardless of the degree to which such criticisms are true, education research has been hampered. Education research comes from a different paradigm than traditional experimental studies[12] and thus, admittedly, has difficulty being valued by those whose credibility comes from that traditional base. It is clear that programmatic research in health professions education has not been established as part of the academic mainstream. Consequently, education research is not well funded, and this has restricted the evolution of education research in the health professions in a unified way.

Despite massive changes in knowledge and application, there has been little shift in teaching methods within medicine for over 50 years.[13] Although innovations in medical education curriculums within specific institutions can be cited, their influence on the broader medical education community has been uncertain. As an example, the development in the 1950s of an organ system-based curriculum at Case Western University has had a long-lasting effect on that institution. The dean responsible for this innovation advocated research to evaluate its effects.[14] However, relatively few medical schools have tried such a curriculum, and of those who have, many have reverted to discipline-based curriculums.[14] Currently, in response to the changing medical care delivery model, many schools are shifting curriculums into the ambulatory setting.[15,16] Some medical educators advocate more ambulatory care education, believing it mirrors more closely what physicians actually do. Can we, in a unified way, test and evaluate the efforts of this change to better understand its consequences such that its impact can be demonstrated for a large number of institutions, over a long term, and eventually on patient outcomes?

Although there is no desire to minimize these new educational efforts, the question arises as to how they do or do not fit into the overall framework of what constitutes a medical education. These efforts should not be perceived as sufficient in and of themselves to mandate how physicians ought to be educated. As overheard at a recent conference on medical education, the process of professional education is fraught with unexamined assumptions at virtually every level. Of concern is not only the identification of these assumptions, but also the degree to which these assumptions hinder rather than facilitate medical education. Without examination of these assumptions, many of the innovations are likely to fail or have limited effect. For example, we need to know how and what to teach in the context of what is good for patients. In addition, we can and should work back to our curriculum after studying more thoroughly what physicians actually do or need to do. Thematic research is needed to better understand the educational process used in the health professions.

In summary, thorough research and evaluation of educational innovations often is not undertaken despite the best of intentions. Such research, when it does occur, is undervalued and underfunded. Thus, the current state of research in medical education is suboptimal. More basic research is needed. Many studies are hampered by weak experimental designs. There is a lack of focused research. Funding is limited, particularly in the important area of long-term studies. What effort has been made to unify the existing knowledge about the impact of introducing new educational models at different institutions does not have wide following. In addition, researchers in the field are hampered by an apparent lack of academic credibility. These difficulties have contributed to a lack of overall strength in education research which, we believe, needs to be brought more on a par with research in the basic sciences.



The Model

Biomedical research has been greatly facilitated by the National Institutes of Health (NIH) model of funding peer-reviewed research proposals. The result has been medical research that is well funded and has established national standards for scientific research with clear impact on many of the scientific aspects of medical practice. In addition, the NIH model has supported and helped promote the academic careers of many physicians and scientists.

We argue that a similar structure should be created for health professions education research. Notice that we have changed and broadened the term from "medical education" to "health professions education." This extension needs to be made. There is much to be gained by similar research efforts in all areas of health professions education, all of which are involved in clinical education. Health disciplines are involved in a costly form of education. Enrollment in eight of them (medicine, registered nursing, dentistry, podiatric medicine, optometry, pharmacy, and allied and public health) in 1985-86 exceeded 350,000.[17] The educational expense of students in these health professions is greater than those of students in other areas of professional training. Consequently, it is not surprising that innovations are suggested, such as the one by Ebert and Ginsberg[18] to shorten the length of time necessary to prepare physicians. Inherent with the concern for costs of training has been the impetus to combine resources across different programs.

Many health disciplines anticipate a declining pool of candidates that could ultimately affect the quality of those accepted into the programs.[17] This decline is of significance and not necessarily well addressed by proposals for new kinds of health professionals, such as the registered care technologist suggested by the American Medical Association.[19] The health professions should share mutual concerns about the education of their professionals. Yet these professions have never been characterized as functioning cooperatively and, generally, can be said to be functioning in isolation. Should there, for example, be cooperation between residency committees for medical and dental residents to provide more effective use of resources and foster multidisciplinary awareness? Who else should be involved with the American Physical Therapy Association in considering certification of the clinical educator and in helping to set a research agenda in clinical education?[20] As previously suggested, systematic research to support these ideas and to evaluate their impact has been difficult to achieve. Cross-discipline communication has been virtually nonexistent.

A national center for health professions research could serve as the central unifying body for coordination of research and program development in health professions education. The center's goals would be to promote, support, and maintain health professions education research. The center's multidisciplinary board would establish the major research priorities subject to annual review. These priorities would constitute the fundable research themes. Through nationally competitive, peer-reviewed grants, the quality of research would be greatly strengthened, the relevant work and materials—now widely dispersed—centralized, and a comprehensive, indepth education research agenda developed and sustained. The center would maintain a central library and archives of ongoing and past educational research, and fund peer-reviewed educational research for scholars working in the field. In addition, center staff would actively gather and maintain information on educational research and innovations beyond those projects specifically funded by the center. These materials would be retrievable by educators and researchers at their own institutions.

In order to facilitate these goals, the center must be organized in such a way as to maximize effective relationships with organizations directly concerned with the education of health professionals. These would include but not be limited to such organizations as the Association of American Medical Colleges, American Nurses Association, American Physical Therapy Association, and American Dental Association. The center would work actively with private foundations that support health education. In no way would the center diminish these efforts. Rather, the center would enhance the activities of these foundations through liaison relationships that give exposure to their efforts and ensure their input regarding the center's research agenda.

The delivery of health care requires that various types of health professionals work together. However, the educational curriculum of each category of health professional is distinct and separate. In failing to know or appreciate the content of each other's education, the professionals ultimately fail to work together as best they should for the benefit of the patient. For example, in our current system, the patient is separately cared for by the physician, nurse, physical therapist, and

other health professionals with little integrative or collaborative effort. Could education research provide us with a better way to model joint health care delivery? The proposed national center for health professions education research must be committed to funding educational research focusing on the professional education of all health professionals and stress research that renders findings and methodologies applicable across the professions.

This research agenda is not limited to multidisciplinary efforts, but, given the common goal of providing health care along with the pragmatic problems of declining enrollment and resources, special attention will be devoted to research efforts focused on multidisciplinary education. Multidisciplinary efforts have had considerable attention over the past 30 years,[21,22] but there still has been disagreement among the health professions over their roles and expertise. We need to face these problems more straightforwardly, including the rationale and consequences of sharing resources. It is essential that these activities be examined. Although multidisciplinary education research may not appear viable to many, the center would strive to maintain a certain level of such activity.

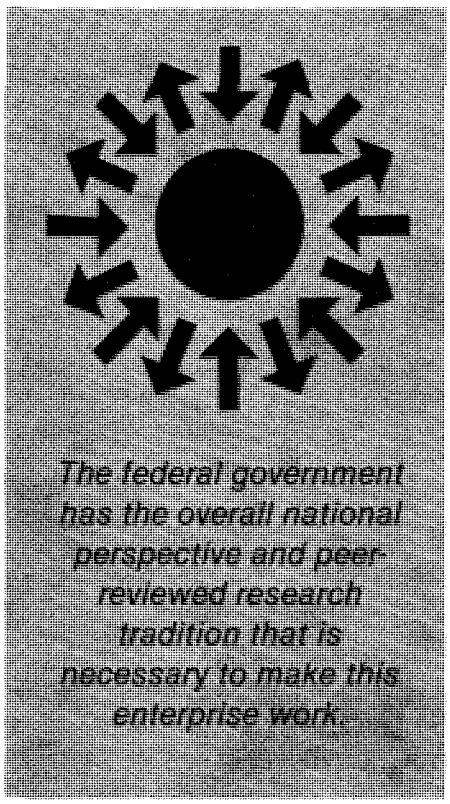
In summary, the traditions of a center for health professions education research would expedite the academic credibility that teaching and its concomitant research have merited. Importantly, a center diminishes the isolation in which much health education research takes place, isolation which has contributed to poor dissemination and implementation of research findings.

The Rationale for Federal Involvement

We believe that the federal government, in the NIH tradition, should sponsor the center. We applaud the efforts of the private sector in medical education and urge foundations to continue their support. However, the federal government has the overall national perspective and peer-reviewed research tradition that is necessary, in our opinion, to make this enterprise work. Additionally, the federal government has monetary resources for education through a variety of existing mechanisms, including, for example, the educational "pass-throughs" of Medicare.

Currently, the federal government spends considerable money for education and training in the health professions. Yet it can be argued that these funds are being spent without the concurrent research necessary to place these programs in proper perspective. It seems to us that such education and training must have a congruent research component that facilitates the implementation of the research findings, something which is rarely done currently. Education research must become a fundamental component of the process of education itself.

The center should be situated as an independent activity within the Public Health Service or allied with a research-oriented agency. Pains must be taken to separate administratively to some degree the research activities from whatever educational training is being funded by the same agency. Where training and research overlap, there is often the tendency for the training, or service component, to dominate. Scientific inquiry must be conducted freely and openly and not be constrained by the service programs. The role of the federal government would be to facilitate research, not to control the curriculum. This is certainly true of the NIH, which as an independent research institution is free from conflicting with the services of hospitals and medical centers.



Appropriate sites for the center might include the National Center for Health Services Research and Health Care Technology Assessment and the National Institutes of Health. Locating the center within the Public Health Service acknowledges the historical responsibility and tradition of this agency for health professions education. Since the center would be a federal responsibility, primary funds to support the center should come from a tax on existing federal funds distributed for education/training in the health professions. Examples include grants from the Public Health Service and the military for preparation of nurse specialists and dental and medical residency. This tax, perhaps at a level of .5%-1%, would set aside a significant pool of money while providing these programs with long-term benefits from such education research. Further thought has to be given to tapping basic or applied research funds that are provided health institutions, since it is clear that such educational research also benefits these programs.

Relationships to Other Organizations and Agencies

How should the center relate to medical schools, other health professional schools, teaching hospitals, professional organizations, and the various regulation, licensing, or accreditation bodies? The center would have roles as a funding agency, a repository of health education research and information, and a collaborator among organizations with similar interests. As a funding agency, the center would solicit proposals from schools, hospitals, and agencies to participate in educational research projects. As a repository, the center would serve these organizations and agencies as they developed grants and implemented programs.

Acknowledging the important contributions that have been made by professional organizations, licensing and accrediting bodies, and private foundations to the development of a quality health professional, the center would strive to facilitate liaison relationships and collaborative efforts among these various entities. For example, the Society of General Internal Medicine (SGIM) and the Society of Teachers of Family Medicine (STFM) have consistently presented medical education research at their national meetings, have participated in each other's meetings and workshops, and have published papers with recommendations for changes. The center could support these activities and link these efforts with the work of others.

Another example where the center could promote collaboration involves the current redrafting of the requirements for internal medical residencies by the Residency Review Committee for Internal Medicine. The new requirements call for, among others, more ambulatory care education and more reasonable working

hours.[23] While many of the changes suggested are noteworthy and of obvious validity, there is no systematic plan to evaluate rigorously the effectiveness of such changes. Further, there are few evaluation data on which to base such changes. The center, in its collaborative and liaison capacities, could facilitate the transition from doing "what sounds right" to doing what is justified by the data as backed up by theory.

The center would not undermine the role of the professional health organizations in fostering interdisciplinary education program development based on the findings and recommendations of studies funded by the center. As an example, professional organizations such as the AAMC should continue to advocate such activities and suggest funding priorities for education research. Further, they should develop strategies to promote the institutional change that is necessary with educational innovation. In addition, the licensing, regulatory, and accreditation bodies need specific mechanisms to keep abreast of education research developments and, perhaps through consensus panels generated by the center, modify their standards accordingly.

Finally, a major concern is domination of the center by medical schools and medical education. This would be addressed in part by the administrative structure of the center, which includes a policy steering committee representing the various health professions.

Discussion

Much conventional "wisdom" militates against the success of research that focuses on education. Difficult issues abound, such as how to evaluate the impact of such research. Nevertheless, the timing of this proposal may be very critical in challenging this wisdom. We have acknowledged that the crisis atmosphere surrounding health care and the cost of preparing providers cannot be ignored. However, cost and manpower demands alone cannot be our sole motivations. An exclusive emphasis on manpower and cost issues may tend to reduce the probabilities of success in education research.[14] We must have a commitment to strategies that will allow us to produce quality providers in a cost-effective, efficiency-oriented environment. The center we have proposed can provide the means to maintain this perspective of health education.

One important function of the center will be to force a healthy reexamination of the goals and values that are necessary to provide the environment for educational innovations. The center will do this through its advisory board, its relationships with professional organizations and licensing and accrediting bodies, and its research agenda. An urgent priority is the need to address the congruency of research and training. As noted earlier, all too frequently training occurs with no relationship to the education research occurring in the same environment.

Funding for education research may begin to bring some degree of parity between education and basic science researchers in health professions' schools and universities. At a recent AAMC meeting, we listened to medical educators in one session asking, "When can we come out of the closet?" And we then had to listen to the response, "Probably only after we have achieved tenure through the traditional route." The only exception appeared to be those education researchers who happened to be with one of the few institutions that specifically fosters and supports such research. Ironically, even these individuals discovered how much educational knowledge was needed that in fact they did not have or could not find. One other issue regarding funding of health education research cannot be ignored. We have a tendency to value the personnel who bring in dollars. Commensurately, we value the knowledge base that attracts dollars. Perhaps, with education research garnering funds, some shift in perspective can occur.

We have joined forces with others who have decried the lack of comprehensive or quality evaluation of what we are doing in medical education. We believe that a strong case can be made that medical education research will alter the way we educate physicians and therefore what is done in practice. We would like to extend that to the spectrum of health professions education. We choose the funded research tradition as a means to remedy this situation in a time when remediation is sorely indicated.

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Clinical Atlas of Glaucoma, E. Michael Van Buskirk, M.D., with five contributors, W.B. Saunders, Philadelphia, 1986, 208 pp., 311 illus., most in color, hardbound, $65.00.

The *Clinical Atlas of Glaucoma* is a useful text. It is written in a classical *atlas* format of facing pages of color photos and their associated discussion. The photos are clear and are amply supplemented with illustrations to ensure understanding of the presentation.

Subject matter opens with the anatomy of the anterior chamber and the optic nerve as they relate to the glaucomatous disease process. Examination procedures are presented and then the various types of glaucoma are discussed individually as to etiology and prognosis. Treatment, side effects and surgical intervention are covered but there is almost no discussion of management considerations in medicinal glaucoma therapy. Also perimetry is only briefly touched upon; the main emphasis is on the clinical appearance of the eye in glaucoma.

On balance, because of the excellent illustrations, this *Atlas* can serve as an effective adjunct or reference text in an ocular disease course. It also may be useful as a clinical handbook for the busy clinician.

Delivering Bad News—A Challenging Responsibility, a videotape produced by Stanley D. Klein, Ph.D., 1988, 25 min., $75, includes postage and handling, available from NEWENCO bookstore.

In this 25-minute videotape, Stanley D. Klein, Ph.D., professor of psychology at the New England College of Optometry, illustrates the challenge of delivering bad news to an optometric patient. Using simulated case presentations employing actors as patients, Dr. Klein presents a step-by-step approach to this crucial area of patient education.

Dr. Klein stresses the importance of the patient's emotional response to receiving bad news and demonstrates how the optometrist can use effective communication skills to facilitate the patient's attempt to come to grips with the fact that he has a vision-threatening ocular disease. There is also an example of an encounter with a patient in which an anxious doctor responds inappropriately to his own discomfort when faced with the responsibility of delivering bad news. Patients with glaucoma and cataracts are simulated on this tape. In addition to focusing on techniques the optometrist may employ to assist the patient through this difficult experience, the presentation includes suggestions for the use of models and written take-home material during patient counseling and education.

This tape uses graphics effectively and is well paced. Its value will be greatest for optometric students and those doctors who are beginning to manage ocular disease in their practices.

Guest Reviewer:
Neal Nyman, O.D.
Pennsylvania College of Optometry

Psychogenic Eye Complaint, a videotape produced by Stanley D. Klein, Ph.D., 1988, 19 min., $75, includes postage and handling, available from NEWENCO bookstore.

In this 19-minute videotape, Stanley D. Klein, Ph.D., professor of psychology at the New England College of Optometry, presents the simulated case of a young female college student presenting to the optometrist with the complaint of headaches. Beginning with an empathic style in the patient interview, Dr. Klein proceeds to express an interest in the patient's life circumstances and illustrates a sensitive approach to gathering a drug and alcohol history from the patient. Finally, Dr. Klein solicits the patient's own views about the possible cause of her problem and concludes the interview with a concise summary and outline of the upcoming examination procedure. The basic elements of effective communication during the patient interview are well demonstrated on this portion of the tape.

After a thorough optometric examination (not on the videotape) reveals no physiologic abnormalities, the presentation includes a step-by-step approach to counseling the patient about what is most likely a stress-related condition. This section includes a non-technical explanation of stress-induced headaches and a method for soliciting the patient's own plan for stress reduction. Dr. Klein demonstrates how the optometrist can tactfully make a referral to a mental health professional and how he/she can ensure continuity of care through thoughtful patient education.

This tape uses graphics effectively. Its value will be greatest for optometric students and those doctors who may not have had the benefit of formal training in communication skills.

Guest Reviewer:
Neal Nyman, O.D.
Pennsylvania College of Optometry

Geometric, Physical, and Visual Optics, Michael P. Keating. Stoneham, Massachusetts: Butterworths, 1988, $60.00, 577 pp., illus., hardbound.

It is amazing how strongly and persistently one is influenced by the style and format of textbooks. In reading Keating's book, I found myself making constant comparisons to Fincham's *Optics,* and wondering why Keating's book was (or had to be) different. To an observer who didn't use Fincham as his/her introduction to optics, this question may be irrelevant.

I found myself wondering how Fincham's students found the learning of optics under the author of the textbook. What happens when the textbook is sundered from the author and the course taught by someone else?

Fincham's book was certainly a knotty one, in that the reader was expected to spend considerable time untangling some of the author's statements. There were certainly times for me as an undergraduate when I could feel a headache coming on whenever I read Fincham's dreaded "it is obvious that."

Keating's book, in contrast, is much more inclined to openness; he doesn't mind taking the reader's hand and walking him/her through various mazes. Few headaches will be generated in this way. The style of problems and illustrations (which are clear and profuse) is certainly quite engaging. Whether it is better to leave the reader with some tough nuts to crack (knowing the effort involved and the accompanying satisfaction) or to spell the facts out fully for the reader is a question which will receive answers as varied as the people reading it.

Historically, the study of reflection has preceded that of refraction; the arrangement of material is different in this book. Thin lenses are studied before single surface refraction, and both are addressed before reflection.

Visual optics (at least in the classic sense of the text by this name written by

Emsley) receives rather short shrift (really only one chapter out of 25), but then the author does state in his preface that this is an introductory text as regards visual optics. There also are numerous silly typographical errors.

The author's use of a closed circle to represent infinitely distant real or virtual objects or images is quite imaginative and useful: this is extended to a representation of far and near points of people with various ametropias, and this is also helpful. The inclusion of a chapter devoted to objects and images is an excellent idea, and should take the edge off some of the problems encountered by the undergraduate student.

There are very few references provided in the book. Although the book is apparently designed to be comprehensive, some outside reading sources would surely be useful.

In his section on images, the author could have mentioned the use of parallax as a way of showing to the observer that the image he/she sees (for instance the image of an object viewed through a thick glass plate) is actually in air as far as the eye is concerned.

A glossary would have been very helpful, because the author is using a system of notation which is different; he does not make use of unprimed variables for object space and primed variables for image space (although this does creep in in some places). The lack of signs for radii of curvature is troublesome to me also. The reason for using or not using matrix algebra is not given, although there is a useful appendix describing its fundamentals.

Fincham's book has been in use for 55 years (since 1934). Only time will tell whether this book will be used as long. There is certainly nothing dated about Keating's book—it has the potential of enduring.

Guest Reviewer:
T. David Williams
University of Waterloo

GLAUCOMA: A Colour Manual of Diagnosis and Treatment, Jack J. Kanski and James A. McAllister, Stoneham, MA, Butterworths, 1989, $75.00.

Drs. Kanski and McAllister have set out "to provide the trainee and general ophthalmologist with a systematic, practical and detailed approach to the diagnosis and management of the various forms of glaucoma." This book contains many excellent illustrations and photographs which will be helpful in the interpretation of clinical signs, especially to the student or clinician who has not evaluated a great number of glaucoma patients.

The book is succinct but reasonably thorough in its coverage of all areas of glaucoma diagnosis and therapy. The initial chapters discuss the physiology of the aqueous humor and pathophysiology of the glaucomas, followed by a discussion of tonometry, gonioscopy, optic nerve head changes, and visual field changes associated with the disease. Then, separate chapters cover the various types of glaucoma, including primary open-angle, low tension and ocular hypertension, primary angle closure, pseudoexfoliative, pigmentary, neovascular, inflammatory, lens-related, acquired secondary, and congenital types. The final chapters consider modes of treatment, including antiglaucoma drugs, laser therapy, and glaucoma surgery.

The chapters are written in a style which the clinician will find useful, due to the fact that there are few wasted words augmented by the excellent illustrations of artist Terry Tarrant. Each chapter is followed by a suggested reading list, which will allow the reader to consult references, providing greater detail in each topic area.

This was not written as a comprehensive text on the subject of glaucoma, but as a color manual, it will be useful to the student and clinician in the diagnosis and management of the various types of glaucoma. The section on visual fields is brief, and only barely discusses the area of automated perimetry. Nor is the discussion of available instrumentation complete, with coverage limited to the Octopus perimeter and the Fieldmaster. The reader will need other references to more fully understand the various instruments available and how they may be used for more accurate assessment and timely management of the glaucoma patient.

In conclusion, I can recommend this book to the student, practitioner, and educator as an adjunct to the other available texts on glaucoma. It is particularly valuable because of the fine illustrations which accompany the text.

Guest Reviewer:
Jeffrey S. Nyman, O.D.
Pennsylvania College of Optometry

The Craft of Teaching, Kenneth E. Eble, 2nd Edition, San Francisco. Jossey-Bass Publishers, 1988, 27 pages, $28.00.

This is a good basic philosophical book for college teachers. As such it is more valuable for didactic than clinical faculty. (One exception to this is the material relating to small group teaching which is useful for clinical seminars.) I would advise all new non-clinical faculty to read this book as it serves as an excellent introduction to college teaching. His discussion of why effective teaching requires more than knowledge of the material is an essential issue, one that needs constant reiteration not only among faculty but among their administrators as well. Eble argues that the purpose of the university is both the production and the dissemination of knowledge.

Professor Eble remarks that effective teachers must develop a style that is consistent for themselves and which interacts with the "disposition for learning that students bring into the classroom." He suggests that this approach to teaching can be developed and altered by such techniques and processes as observing and being observed, videotaping one's lectures, and being sensitive to student reactions and behaviors.

Dr. Eble compares the preparation for a lecture with a performance. He suggests that the teacher should carefully identify the salient points and how they will be presented. The use of a tape recorder prior to the class can help in both the timing and the delivery. He recommends that the teacher make necessary modifications of a prepared lecture immediately after its utilization, while the information is still fresh. Thus the next presentation of this material will be improved by the experience. He feels that one of the more common failings in the classroom is the desire to cram more and more material into the hour. This problem is illustrated by the story of the successful professor who told the author that although he teaches biology, a field where knowledge is exploding, he seems to teach less and less each year. This biologist is concentrating on student understanding of concepts as opposed to absorbing many facts. Those of us teaching in the classroom are well aware that we must select from the available material. A common problem with new faculty is their wish to present everything they know about the subject; they are reluctant or fearful that they will prioritize incorrectly.

The Craft of Teaching should be in the libraries of the schools and colleges of optometry, but I would not urge readers to go out and purchase it for their own libraries.

Guest Reviewer:
D. Leonard Werner
State University of New York
State College of Optometry

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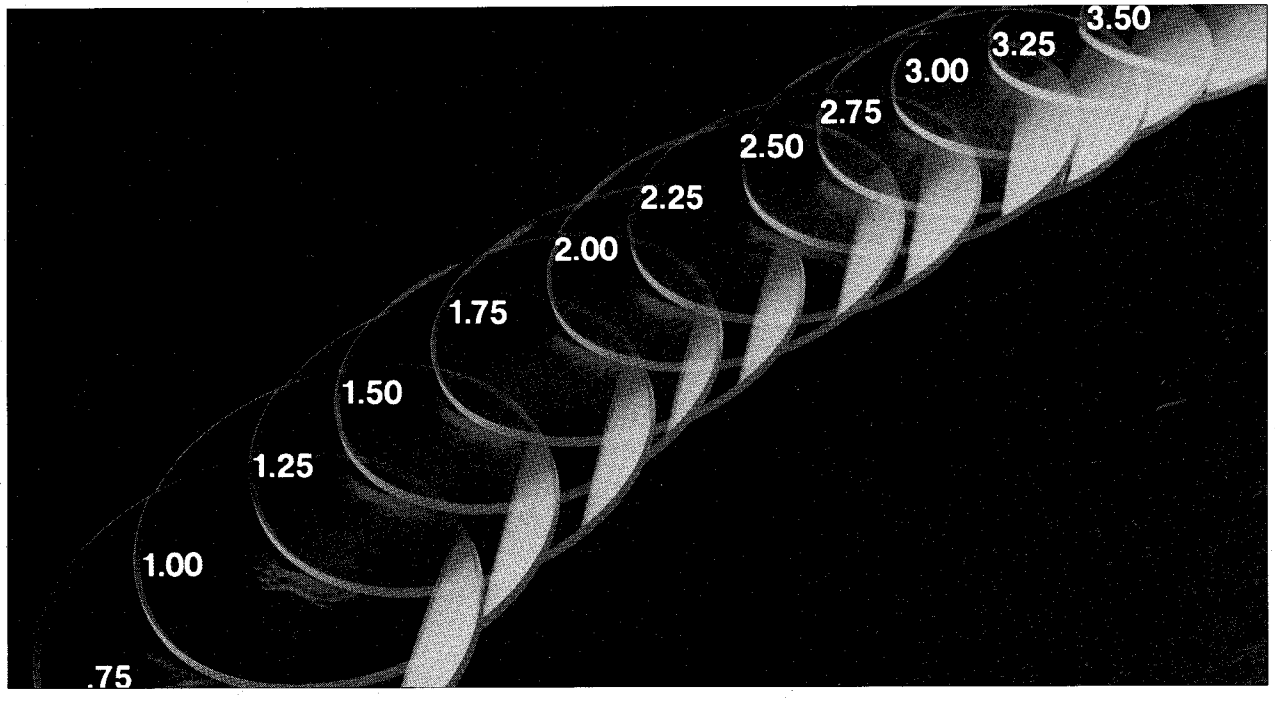

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