2-10-1978

Life spring thesis

Thomas Seiler  
*Pacific University*

Bert M. Peterson Jr  
*Pacific University*

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Abstract
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Degree Type
Thesis

Degree Name
Master of Science in Vision Science

Committee Chair
Robert L. Yolton

Subject Categories
Optometry

This thesis is available at CommonKnowledge: https://commons.pacificu.edu/opt/504
Life Spring Thesis

A Thesis
Presented to the Faculty of the College of Optometry
Pacific University

In Partial Fulfillment of the Requirements for the Degree Doctor of Optometry

By

Thomas Seiler
Bert M. Peterson, Jr. Advisor
Dr. Robert L. Yolton
February 10, 1978
Introduction

In this study we attempted to determine whether or not the practicing of Life Spring Visual Training for a five month period would bring myopes to a state closer to emmetropia (defined as 7a in the OEP 21 point exam). We also investigated changes in accommodative facility, accommodation and vergence ranges, and phorias as a result of this five month period of visual training.
Abstract

The Life Spring Foundation is an organization designed to train people through various psychological exercises to develop productive attitudes and emotions. We attempted to determine if the Foundation's vision therapy program results in a clinically significant change in the refractive error of myopes if practiced over a period of five months. In an analysis of eight myopes who were at various stages of participation in the program, we found that there was no significant reduction in myopia for the group. We concluded that the activities of this group had little or no effect on the refractive error of the subjects involved.
Attempts to Reduce Myopia

Dr. William H. Bates, a New York ophthalmologist in the early twentieth century, was the originator of so-called unorthodox methods of visual training. The goals of his training were reduction of refractive error and complete restoration of ocular health.

Bates believed that defective vision and even certain eye diseases were brought on by physical and/or emotional stress. In his book, *The Cure of Imperfect Sight by Treatment Without Glasses*, he stated, "The obliques are the muscles of accommodation; the recti are concerned in the production of hyperopia and astigmatism. Myopia produced by unconscious strain to see at a distance is increased by conscious strain." ¹

Bates' techniques of sight training aim toward complete relaxation of the extrinsic ocular muscles which he stated would lead to emmetropia. These techniques include

1) Central Fixation (shifting gaze to all parts of an object instead of staring), 2) Palming (covering the eyes with the palms and imagining total blackness), 3) Memory, 4) Imagination, 5) Shifting and Swinging (rhythmic movements which aid in relaxation), 6) Sunning (facing the sun or a bright light with the eyes closed).

Bates based his ideas of accommodation on his reported
observation of accommodation in aphakes, and on his inability to observe any change in the shape of the lens during accommodation in certain animals. He said in a later book, "In my experiments upon the extrinsic eye muscles of fish, rabbits, cats, dogs, and other animals, the demonstration seemed to be complete that in the eyes of these animals accommodation depends wholly upon the action of the extrinsic muscles and not at all upon the agency of the lens." Bates believed that the extrinsic muscles were responsible for vision at far and near, and that any stress on these muscles induced refractive errors.

O.D. Rasmussen pointed out a basic flaw in Bates' conclusions: "He (Bates) was laying down a radical contradiction of accepted human physiology and yet produced data on the eyes of animals and fish." Rasmussen also pointed out that since the oblique muscles of the human eye do not surround the globe entirely, they could not exert an even pressure throughout the whole diameter and therefore could not cause a uniform stretching of the eyeball and accommodation.

Rasmussen felt that the title of Bates' book, Perfect Sight Without Glasses, was misleading. He states that Bates' definition of "perfect sight" was not, "perception of the Snellen one minute angle standard", but "a pair of eyes seeing - well or indifferently - without pain or discomfort and free of the anxiety to better their visual
However, Bates was not without disciples, among them being his wife who had later editions of his first book published. Mrs. Margaret Darst Corbett was also a proponent of the Bates Method of sight training. She was formerly the principal of the School of Eye Education in Los Angeles where she trained instructors to teach the Bates Method. She offers simple instructions to the layman for the improvement of vision in her two books, *Help Yourself to Better Sight* and *Quick Guide to Better Vision*. Like Bates, she claimed instant improvement in several cases of visual disorders, including a cure for presbyopia.

Aldous Huxley, author of *Brave New World* and *The Art of Seeing*, stands out as the intellectual proponent of the Bates Method. He bypasses the physiological aspects of the Bates Method and stands on results as the final evidence for the viability of the method. He states, "For my concern is not with the anatomical mechanism of accommodation, but with the art of seeing—and the art of seeing does not stand or fall on any particular hypothesis."

In a book review of *The Art of Seeing*, Duke Elder wrote that Huxley had bilateral keratitis at age 16 which "left him with greatly reduced vision". He went on to say that Huxley's condition improved quite naturally on its own. After taking up the Bates Method his vision improved again and he became an ardent devotee of the Bates Method which
led him to write *The Art of Seeing*.

Duke Elder firmly denied any benefit to the visual system through the Bates Method. In some cases, he said it was even dangerous, as for a person with a serious medical problem like detached retina or glaucoma. He stated, "Whatever be the value of the exercises, it is quite unintelligent of Huxley to have confused their advocacy with so many mis-statements regarding known scientific facts. It has been shown that the hypothesis upon which these methods are based is wrong."^6

Dr. Marylin B. Rosanes-Berrett, Director of the Gestalt Center of Psychotherapy and Training, has combined Gestalt psychotherapy and sight training. In her book, *Do You Really Need Eyeglasses*, she cites Bates as "a magnificent pioneer". She says that the reason the Bates Method was not accepted by ophthalmologists was because of pressure on the American Medical Association by the optical industries of the time. She also states that the AMA never investigated Bates' proposals and soon withdrew his membership from the organization.

Graf Wiser followed Bates in time and added on to Bates' theories of accommodation with several unorthodox ideas of his own. He offered no data, only more theories. He assumed that myopia is a "ciliary spasm" and proposed to treat it by applying very strong convex lenses. He indicated that this would force the spasm to "relax" to some point,
"where the eyes seemingly cannot accept any stronger lenses and cannot relax further".7

Walter B. Lancaster, the "late dean of American Ophthalmology", gave his view of eye exercises (as a means of correcting refractive errors) when he said, "...it follows that by repetition, by practice, by exercises, one builds up a substratum of memories useful for the interpretation of sensations and facilitates the syntheses which are the major part of seeing".8 He believed that so called myopia "cures" were the result of practice in the interpretation of an out-of-focus retinal image.

Public interest in eradicating myopia increased in the United States in the 1940's because of the start of World War II. Thousands of men were rejected by the armed forces because they were nearsighted. Many sought the aid of the ophthalmic professions in their desire for a "cure" for their myopia. Undoubtedly many also took up the unorthodox methods of Bates during this period. These factors spurred interest into the area of study of myopia reduction.

One of the original studies done was the Baltimore Myopia Control Project. The purpose of the project, as stated by the ophthalmologists who took part in it, was "to determine if methods of non-surgical training for the reduction of myopia and improvement of deficient vision have any effect in the reduction of organic myopia, or produce actual improvement in the distance visual acuity of
The project, as described in the Journal of American Optometric Association of January, 1946, took place in Baltimore and involved 111 subjects. The subjects represented a cross section of the myopic population ranging in age from nine to thirty-two years.

Ophthalmology and Optometry were to work entirely independently in this project. Ophthalmologists took visual acuities before and after the visual training program. Optometrists organized and conducted the visual training. Each trainee was scheduled to receive 39 training periods during 3 months (September - December, 1944).

The average number of training periods completed was 25. The subjects' acuities were measured after the 3 month training period and again 5 months after the training was over. According to the JAOA article, the optometrist in charge of the visual training reported an improvement in visual acuities, both monocularly and binocularly, for all but five trainees after the 3 month training period was over. The acuities were measured at this time on the Clason Visual Acuity Meter.

When acuities were taken again in May, 1945 after five months of unsupervised use of near prescriptions, it was found that of 71 trainees, only three had lost all of their previous gain in visual acuity. Acuities taken from the Snellen Letter chart were reported in the article because "letters had been used on all previous tests".
Personality changes in the trainees were also noted by an independent observer named Glenna E. Bullis. She noted improvements in scholastic achievement and sports and more balanced personalities as a result of participation in the project.

Alan C. Woods, M.D., summarized the ophthalmological position on the results of the Baltimore project. He stated that "the changes in the percentage visual acuity noted was found to lie within the limits of error of subjective testing of the visual acuity. ...It was believed by the examiners that education in the correct interpretation of a blurred visual image was the chief factor in the improvement noted." He concluded that visual training was of no value in the treatment of myopia.

In 1947 J. Donald Kratz presented data from a study done by Edward Jackson in 1931. Jackson examined 154 eyes which had worn a full minus correction for three years. He reported that 45% of the eyes showed no increase in myopia. Kratz's conclusion was that "it is important, therefore, when assaying the results of any visual training technique in the care of myopia, to balance the results of that technique against the probable results if no technique of training had been undertaken." Kratz believed that the only physiological change that could take place as a result of visual training was in the functional and pseudomyope, where the ciliary body of the eye is in a hypertonic condition.
In another article, "Effect of Visual Training on Existing Myopia", a study was presented in which 54 patients with myopia were given a course of visual training. The technique of training was "based on standard accepted procedures in this field" and was given by an optometrist. Pretraining and post training examinations were given by ophthalmologists.

Twelve patients, or 22%, showed definite improvement. Only 5 retained their improvement after 23 months. "It was thought that the improvement occurred because of improved reception due to stimulation of the visual effort, as the best results were obtained in patients with a pretraining acuity less than would be expected from their refractive error, 73% of this type showing improvement."12 The authors concluded that "Visual training has a definite, but limited, value with some myopic patients, particularly those whose vision does not correspond with their known myopia."13

Variations in the Acuity of Myopes

Various studies have been done which show that at least a few myopes can change their acuities at will. These "flashes" of clear vision could rarely be sustained for more than three minutes.

One possible explanation of these temporary improvements in acuity is negative accommodation, that is, the flattening of the lens by conscious effort. This was studied by Yves Le Grand in the early 1950's. His subjects
were three emmetropes whose left eyes were made myopic by a 3 or 4 diopter convex lens and two myopes whose refractive error was greater than 4 diopters. The left eye fixated a visual acuity chart while the right eye (which had no lens in front of it) was examined by skiascopy.

Le Grand found that the conscious visual effort to increase acuity accompanied a reduction in the power of the eye by an average of 2.50 diopters. He also found that in every case, the astigmatic error changed in axis and/or power. Because of the astigmatic variation (which he said did not take place in the cornea) he concluded that the lens of the eye was responsible for the reduction of myopia.

Further evidence for this phenomenon was introduced when Le Grand instilled the cycloplegic homatropine into the left eye of one subject. In this situation the subject could produce only about 1.50 diopter reduction in the power of the eye. Le Grand concluded that any "successes" produced by practicing the Bates Method could be attributed to the phenomenon of the flash.

About one year later Elwin Marg attempted to confirm Le Grand's finding of negative accommodation in myopes. His subjects consisted of five specially selected myopes who could flash. He found no change in the power of the eye (as measured by skiametry) from normal to flash vision. However, visual acuity improved during flashes from around 20/200 to 20/50. But he also noted, "It is frequently
a slow process to get a flash and there was usually some stumbling over letters ... most subjects were apologetic about the quality of their flashes, explaining that at one time they could clear up everything perfectly but at present the flashes were poor because of lack of practice. 14

No subject in Marg's study could produce better than 20/50 acuity while fixating the Snellen chart. Marg suggested that "the Bates Method improves the perceptual image by training interpretation of blurs, and by accumulation of visual information during the relatively long time required for the eliciting of flashes." 15

James R. Gregg also attempted to explain the phenomenon of "flashes" in myopes. He used three myopes who could perform flashes as his subjects. He found that even under full cycloplegia each of the subjects could still perform flashes which resulted in large improvements in visual acuity. This eliminated negative accommodation from the consideration. Gregg also made reference to several authorities in the field when he discounted changes in corneal curvatures, changes in the length of the eyeball, and changes in the indices of the media as possible sources of the flash. The use of the retinoscope and Scheiner's disc demonstrated no refractive changes between "flash" and "no flash" vision. Gregg concluded that factors beyond the mechanics of the eye must explain the existence of the phenomenon.

M.E. Van Orden has developed a visual training procedure
named the Van Orden Rehabilitation Technique. As part of his program of visual training for myopes he has included his original Deep Wink Technique which is supplemented by the Quick Blink Technique. These techniques are used to induce what could be termed a "flash" of clear vision in the myope. Dr. Jane Carmichael of Pacific University College of Optometry has instructed many young functional myopes in this technique. She stated that she has had myopic patients who could clear distant objects, such as scoreboards and faces, at will, when using the Deep Wink Technique. The technique includes deep inhaling and exhaling while keeping the body very tense and the eyes wide open. Then the body is relaxed while the eyes remain alert and wide open. Since this is difficult a Quick Blink may be inserted, which is a "quick blink" that doesn't interfere with concentration. An alert, wide open posture of the eyes is maintained. The patient is required to scan the periphery of the object viewed, rather than stare at it centrally, and also to look beyond the object, towards the background. The patient is supposed to be able to read smaller acuity letters while using this technique than under normal conditions of viewing. Whether or not this phenomenon has anything to do with the "flashes" of clear vision which were investigated by Le Grand, Marg and Gregg is unknown.
The Life Spring Foundation of Portland, Oregon is a subsidiary of the California based Life Spring Inc. of America. The national group's stated purpose is to help people develop productive attitudes towards themselves and others and to extinguish unproductive attitudes. They claim to do this through various psychological and emotional exercises designed to uncover the basis for an individual's feelings, helping the person understand himself and his reactions to certain situations in his life.

The Foundation has sponsored a vision therapy group to help members free themselves of the need for corrective lenses. The specific therapy the group used is not known by the investigators because this information was not made available to us by the group members. However we do know that their methods of training follow the order of Bates' training and are therefore considered unorthodox by the optometric community. Our goal for this study was merely to find out whether there was any change in the visual state as a result of this therapy if practiced for a period of five months.
Methods

The subjects in this study were volunteers from the Life Spring Foundation vision therapy program who, at the beginning of the study, had either just started or were currently participating in the program of vision therapy. They consisted of five men and three women ranging in age from 25 to 48 years old. All subjects were myopic with less than 2.00 diopters of refractive astigmatism. No subjects had ocular pathology and only one was on medication (Diabenise for diabetes). Most of the subjects appeared highly motivated with a sincere desire to prove or disprove the validity of the vision therapy and to obtain actual substantiation for their own progress.

We performed two complete 21 point exams on each subject in the study, one investigator doing all of the initial exams and the other all of the final exams. At the time of the first exam the subjects varied as to their level of involvement in the program, and we desired to measure with the second exam any change in the individual's visual state as a result of five months of participation in the group. A control group consisting of three young myopes not participating in the vision therapy was set up to detect examiner variability.

In the final exam, unaided acuities were done with a single letter to prevent possible memorization of charts which could alter the data.
The details of how the subjects were handled and of what the examination consists are available in the forms, "Human Subject Release Form" and "Instructions to the Participating Volunteer". Each of these forms was made available to the subjects to inform them of what we were investigating and what was required of them. Forms entitled "Questionnaire" and "Case History" were designed to reduce the time of the exam and to maximize the amount of information received by the investigators. The "Case History" asked for previous medical and visual history and the "Questionnaire" asked for information about the subjects level of involvement in the vision therapy group. All of these forms are available in the appendix section of this thesis.

Our analysis of the data consists of a statistical "t" test of the findings. This is merely a statistical comparison of "before" and "after" data taken from two different visual exams.
Discussion

We were unable to detect any significant changes in the data with the exception of one test. Two other tests presented us with significant variation which was negated by the existence of significant changes in the control group. This indicated a high probability that these significant changes were a result of variation in experimenter technique.

The one test that presented us with significant changes was the keratometer measurement of corneal curvature in the horizontal meridian of the right eye. However, the measured curvature steepened over the five month period suggesting an increase in myopia instead of the decrease hoped for by the vision therapy group. It would also be difficult to explain an increase in curvature in terms of training techniques whether they be conventional, Bates', or Huxley's exercises.

One subject did present us with a decrease in myopia of one diopter in the 7a test. This corresponded with an increase in binocular visual acuity at 20 feet of from 20/200 to 20/100, and a change in the maximum plus to 20/20 (7 test) of .75 diopters. The subject herself did not subjectively report any improvement in her ability to see. She did, in fact, report that she had become discouraged with the vision therapy program and, at the time of the second exam, stated that she would very likely return to full time spectacle wear. We cannot make any kind of
statement to the effect that this subject's vision was improved as a result of participation in the vision therapy program. We say this because of the fact that this was an isolated case indicating that other factors may have entered into play, such as experimental error or naturally occurring changes in the visual state.

Finally, we consider it significant that no significant changes occurred in the group as a whole in the significant tests of retinoscopy (test 4), visual acuity, and maximum plus to best visual acuity (test 7a).
Analysis of Data

Levels of significance ("t" test) calculated from findings on tests which demonstrated some variation in the data collected.

<table>
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<th>Value of &quot;t&quot; Control Group</th>
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<td>vert.</td>
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Note: Criteria of .05 for significance
Conclusion

We conclude that this research project does not support the claims of improved vision made by the Life Spring Foundation's vision therapy group. Over the five month period of this study, the activities of this group had little or no measured or observed effect on the visual state of the subjects involved.
Footnotes


2 Ibid., 39.

3 O.D. Rasmussen, Myopia Control (Great Britain, 1956), 57-58.

4 Ibid., 57.


7 Rasmussen, 61-62.


13 Ibid., 410.


15 Ibid., 183.
Bibliography


