Who is Oliver Sacks?

Oliver Sacks is a neurologist of mythic literary proportion. His first published book, in 1971, was on the subject of migraines, and set the tone for his ability to capture the essence of clinical conditions in a fashion that few had done before. The book that launched Dr. Sacks’ publishing career, however, was *The Man Who Mistook His Wife for a Hat*. A collection of clinical vignettes now elevated the case report into a genre of literature suitable for reading by the general public. Dr. Sacks would embark on a trend where he would first pen his stories for publication in *The New Yorker* magazine, followed by compilation in book form.

Wider fame found Dr. Sacks when his book, *Awakenings*, was made into a movie with Robin Williams playing the part of Dr. Sacks, and Robert DeNiro as the star patient awoken through unconventional use of the drug, L-Dopa. But *The New Yorker* piece that first caught the eye of optometrists, and raised a few eyebrows in the vision science community as well, was the story about Virgil, entitled “To See and Not See.”

Optometrists have long held the belief that vision is a learned process. Blind in his youth due to clouding of his corneas, Virgil proved this maxim when he underwent a corneal transplant as an adult. Presented with the paradox of clear eyesight, yet absent the knowledge of how to utilize his vision, Virgil was tormented rather than helped by the surgical procedure. This, too, became the subject of a movie, “At First Sight.”

Dr. Sacks’s initial exposure to optometry

Behavioral optometry is the branch of the optometric profession most closely engaged in clinical vignettes. It was inevitable that a group of behavioral optometrists would find Dr. Sacks’ writing so compelling that he was invited to speak at a forum in San Diego. Southern California is no stranger to scientists immersed in the pursuit of vision. Francis Crick, for example, spent a sabbatical year at the Salk Institute in La Jolla and rediscovered a passion for vision that he had set aside in pursuing the molecular structure of DNA.

Following Dr. Sacks’ presentation to the group, several optometrists, most notably Paul Harris, addressed the implications of his work to clinical vision care. Dr. Sacks was given an award during a luncheon honoring Bob Wold, a pioneer in organized behavioral and developmental optometry in Southern California. We had hoped that this interaction would pique Dr. Sacks’ interest in optometric vision therapy. It did not at that time. Without a patient to help him bridge the gap between what he didn’t know about optometry, and what he did know about vision, the chasm was too broad.

Stereo Sue and Dr. Ruggiero bridge the gap

Sue Barry would prove to be that patient. Dr. Barry teaches neurobiology at Mt. Holyoke College in Massachusetts. Each year she would dutifully advise her undergraduate class of new
developments in the field of neuronal plasticity. But something was gnawing at her. As a patient with strabismus, Sue would periodically ask her eye doctors about options for improving her binocular vision. She was repeatedly told that she was too old to develop binocular vision. Her last ophthalmologist intimated that since she had 20/20 acuity with each eye, she should either accept her vision the way it was, or see a psychologist. It was obvious to her that there was a disconnect between what neuroscience had to offer and conventional wisdom in ophthalmologic practice.

Determined to locate a practitioner willing to embrace an approach toward plasticity in adulthood that vision science was supporting, Sue eventually found Theresa Ruggiero, O.D., FCOVD. Dr. Ruggiero made no value judgment about the benefits that Dr. Barry might experience by undergoing vision therapy. As a behavioral optometrist engaged in developmental and neuro-opthalmic rehabilitative aspects of care, Dr. Ruggiero advised Dr. Barry that adults could indeed benefit from residual plasticity in binocular vision connections. There would be no shortcuts. To develop binocular perception, Sue would have to work diligently and consistently on the procedures that Dr. Ruggiero prescribed. It seemed intuitive to Sue that if binocular vision was a learned process, it might not be too late for effective learning to occur. She felt empowered by the challenge.

After a relatively short period of time, Sue began to expand the binocular connections in her brain from both eyes. The most intriguing aspect of this change was when stereovision emerged. At first, she felt like a traveler in a foreign land. The mathematician, Edwin Abbott, described this type of three-dimensional transformation in “Flatland.” Spaces between objects became palpable and popped out. The world took on a beauty and depth that repeatedly gave Sue pause. But the euphoria of developing dimensions of vision that she had heretofore only read about was tempered by remorse. Why had Sue not been given the option before of pursuing vision therapy?

With Dr. Ruggiero’s encouragement and guidance, Sue not only continued to develop her stereovision, but also delved into the mythological biases against vision therapy. Substantiation of the folklore that strabismus can’t be effectively treated with therapy after early childhood stemmed from the Nobel winning work of Hubel and Wiesel. Sue corresponded with David Hubel, and he acknowledged that their work on strabismic monkeys was over-extrapolated and led to the assumption of an irreversible loss of binocular vision in humans with strabismus. Hubel elaborated on this recently in a book celebrating his successful collaboration with Wiesel, when he pointed out that no studies were done to assess recovery of binocular function in animals in which the strabismus was reversed.

**Reaching back to look forward**

It was not adequate for Sue to have experienced a personal triumph against all odds. She was moved to validate as well as share her experiences, and to see that others might at least be advised of clinical options based on sound neuroscience. Sue thought back to a casual conversation in January, 1996, with Oliver Sacks. An aficionado of space travel, Dr. Sacks had attended a prelaunch party for Sue’s husband, Dan, a physiatrist and astronaut who was about to embark on his first space shuttle flight. When Sue described her alternating strabismus to Dr. Sacks, he asked her if she could imagine what it was like to see with two eyes. Sue responded that she thought she could.

Eight years later, however, after obtaining stable binocular vision, Sue wrote Dr. Sacks a letter saying that her theoretical knowledge of stereopsis did not prepare her at all for the actual experience of seeing in depth. Dr. Sacks was intrigued. Being a responsible medical sleuth, he was understandably reticent to take her word at face value. Yet how does one discount the anecdotal experience of a credible patient? Breakthroughs as a result of understanding clinical observations were the hallmark of Dr. Sacks’ career. And so he traveled, with an ophthalmologic colleague, to visit Dr. Ruggiero’s optometric practice. Surveying the procedures used in developing binocular and stereoscopic awareness, and listening to Dr. Ruggiero and Sue describe their doctor-patient collaboration, Dr. Hubel’s comments about remaining open to the possibility of developing or restoring binocular vision in adulthood fell into context.

**The impact of the New Yorker and NPR**

The story of Stereo Sue was born, and through a series of iterations became the latest signature Sacks piece in The New Yorker magazine issue of June 19, 2006. Yet the subject of this Sacks piece is atypical, for Stereo Sue has a scientific persona of her own. Her story is not one of self-determination in the face of challenge or disease, but of resolve in aiding her quality of life in the face of medical indifference. Sue’s plans call for a sabbatical from teaching neurobiology, during which she will take time to travel, discover behavioral optometry in more depth, and begin writing a book for public
consumption about plasticity of the visual system and her experiences with vision therapy. She is scheduled to present a lecture to College of Optometrists in Vision Development (COVD) members on her experiences at this year’s annual meeting in Phoenix.

Sue’s experiences were catalogued on NPR (National Public Radio). On the Morning Edition, June 26, NPR Science Correspondent, Robert Krulwich, wove together her story using snippets of interviews with Drs. Barry, Hubel, Ruggiero, and Sacks. As much as The New Yorker is widely read, and generated voluminous inquiries, NPR captured an equally broad and perhaps greater audience. The program came to the attention of many listeners, including staff of the American Optometric Association. This prompted the AOA News to print an extensive feature on Dr. Barry and her collaboration with Dr. Ruggiero, as well as on the NPR story.

What will be the outcome of “Stereo Sue”?

Oliver Sacks wrote the foreword to Temple Grandin’s now famous book, Thinking in Pictures. Grandin was compelled to share her life’s experiences with the public so that more people would understand what it is like to function through the eyes of an individual with autism. While it would be delightful to see Oliver write a foreword to Sue’s forthcoming book, that would be icing on the cake at this point. Merely by publishing “Stereo Sue,” Dr. Sacks has opened the door to wider thinking on the part of doctors and patients who might otherwise have continued to dismiss strabismus as merely a cosmetic inconvenience.

This is much more of a beginning than an end to a story. Dr. Barry expresses herself eloquently, as can be noted in her writing and quotations of her. It is worth highlighting that the story in The New Yorker debunks the notion she was given by certain doctors that vision therapy is “a waste of time and money.” While many patients are able to overcome this misguided advice, and do find their way to optometrists conversant with vision therapy, many others do not. I have no doubt that the positive light in which vision therapy is cast, both in The New Yorker piece and on the NPR program, confounds the efforts of those who spread misinformation about VT.

But what is it that we give patients to expect through vision therapy? Clearly Sue’s case could not have been addressed adequately through prism alone, yet prism was a key factor in helping her. Clearly Sue will not likely develop normal binocular vision or a high level of random dot stereopsis, but her success underscores that as binocular vision exists on a continuum, the results of vision rehabilitation exist on a continuum. Vision scientists to date have had very limited exposure to vision therapy, and tend to see rehabilitation in absolute terms.

For many years we have observed an erosion of interest in vision therapy among ophthalmic practitioners. The reasons for that are manifold and complex, and beyond space or time for discussion here. If the story of Stereo Sue has indeed rekindled interest, and patients are inspired to seek optometric vision therapy services, will they be satisfied with the outcome?