



SCHOOL OF OPTOMETRY

# Borish Center for Ophthalmic Research

*1995–2020*

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# Introduction

In 1995, Indiana University's Borish Center for Ophthalmic Research opened in the IU School of Optometry.

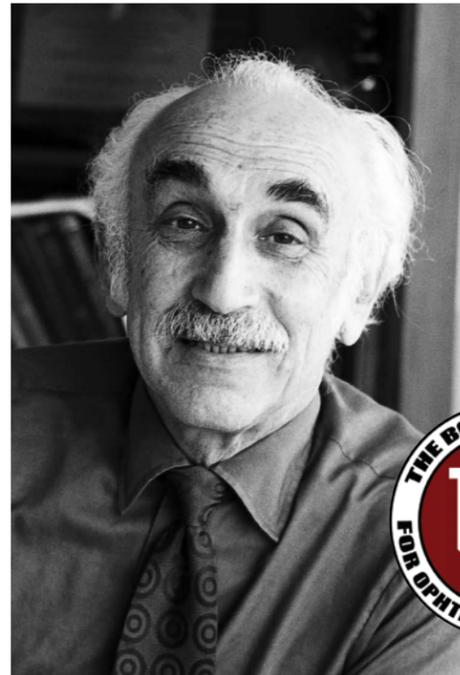
This was thanks to the efforts of many individuals and units, including the Indiana Chapter of the American Academy of Optometry, Indiana University, the IU School of Optometry, and, of course, Dr. Irvin M. Borish and his wife, Bea. In 2020, we are very pleased and honored to introduce this 25th anniversary retrospective of the Borish Center. How time flies!



IU ARCHIVES

Above, Dr. Irvin M. Borish examines a patient in his lab at the IU School of Optometry

Above right, Dr. Borish

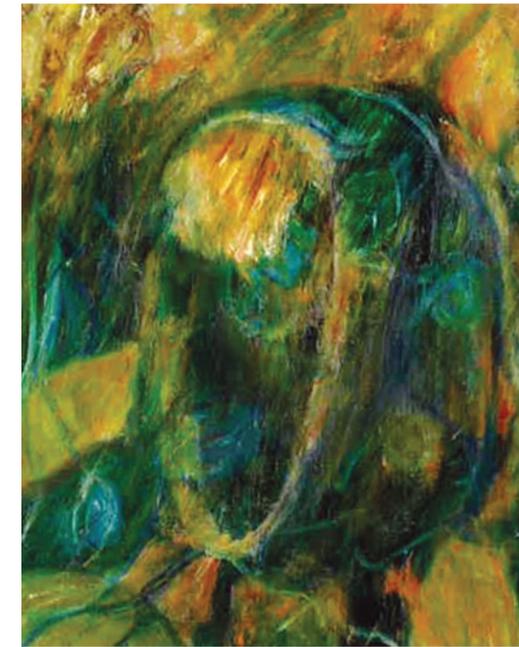


IU ARCHIVES



In a special report dedicated to the center's opening, Gerald Lowther and Sarita Soni, the Borish Center's inaugural co-directors, wrote that they "envisioned unbounded opportunities for scholars" in a center that would not only be a resource for the School of Optometry and IU more broadly, but also would be "a resource for the community, the ophthalmic industry, and the ophthalmic professions." They aimed for the center to "promote maximum interaction among researchers to address pressing vision questions."

Without question, that vision has been achieved. Since its inception, the Borish Center has helped IU's School of Optometry complete more than 200 patient-oriented projects sponsored by the National Eye Institute, foundations, and industry, with grants totaling nearly \$7 million in 2019–20.



Left, *Alley in Jerusalem, 1970*  
Irvin Borish

Right, *Abstract Woman, 1970*  
Irvin Borish

Among the hundreds of notable studies conducted under the auspices of the Borish Center, there are dozens of milestone projects including the multisite Collaborative Longitudinal Evaluation of Keratoconus (CLEK) Observational Study; groundbreaking studies of contact lenses; work on myopia development, macular degeneration, glaucoma, amblyopia in children, and traumatic brain injury outcomes; and much more.

Twenty-five years ago, patient-based translational research was in its early stages as a way to move vision science forward. Since then, the Borish Center has excelled at this work, advancing the field of vision and eye research internationally and changing the way doctors provide care to their patients.

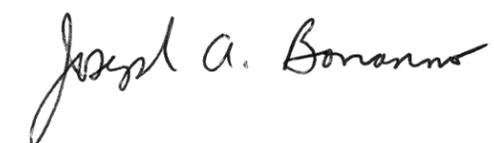
In the following pages, you'll learn more about a few notable Borish Center achievements over the last 25 years, from the perspective of several remarkable individuals who have contributed to the dynamic success of the Borish Center and the School of Optometry. You will also learn a bit more about the notable namesake of the center, Irv Borish.

Irv was very talented and influential within the field of optometry and vision science, but he also held

many talents outside of optometry, including painting. Another painter, the 20th-century artist Paul Klee, once said, "Art does not reproduce the visible, it makes visible." We're very proud to be associated with the Borish Center's distinguished history of "making visible"—pioneering discoveries to advance vision research as well as protecting, treating, and improving the vision of Hoosiers and people around the world.



**Pete Kollbaum**  
Associate Professor  
Associate Dean for Research  
Director of the Borish Center for Ophthalmic Research  
Indiana University School of Optometry



**Joseph A. Bonanno**  
Dean and Professor  
Indiana University School of Optometry

# The beginning

“Refraction” is defined as the act of focusing, of seeing something clearly, improving vision. Irvin M. Borish certainly did that, not only for countless individual patients but for the entire field of optometry.

In 1944, when Irvin M. Borish opened his first optometry practice in Kokomo, Indiana, no one yet called him “the father of modern optometry.” But that is who he became, in the eyes of optometric researchers and professionals around the world.



Irvin M. Borish, circa 1933

Known to many as simply “Borish,” he was born in Philadelphia and educated at the Northern Illinois College of Optometry, where he also served on the faculty following graduation. Arriving in Kokomo to begin his first practice, Borish was already deeply involved in the work that would make him an icon of his profession.

Having published *Outline of Optometry* in 1938, Borish went on to write and publish the first edition of *Clinical Refraction* in 1949. Over time, the textbook steadily became the standard in the field—as editor William Benjamin wrote in a preface to the renamed *Borish’s Clinical Refraction* in 1998, “the text helped substantially to educate as well as to train a generation of eye care clinicians and clinical scholars. ... Truly, [Borish] is the primary architect of ophthalmic education and practice.”

During his time in Kokomo, Borish also met other young eye doctors who had a vision to establish a school of optometry at Indiana University. By 1953, they had accomplished that goal, and the IU School of Optometry was inaugurated on IU’s Bloomington campus. Borish spent the next two decades commuting weekly to the school as a visiting faculty member, until 1972, when he assumed a full-time position as professor at the school, serving as director of patient care and teaching classes in his area of expertise: contact lenses.

An inventor with five patents in the contact lens field, Borish created the school’s first clinical research unit and served on the faculty until 1982, when he was named to the first endowed chair at the University of Houston College of Optometry. Throughout the decades, he amassed an exhaustive list of prestigious honors and awards, including the 1999 issue of *Review of Optometry* selecting him as “the most influential



ILLINOIS COLLEGE OF OPTOMETRY



Left, Dr. Borish at the Northern Illinois College of Optometry

Right, Dr. Borish in a meeting with colleagues

“{Borish} is the primary architect of ophthalmic education and practice.”

William J. Benjamin,  
Editor of *Borish’s Clinical Refraction* textbook

optometrist of our time” and the “O.D. of the Century.” Borish died in 2012 at the age of 99.

Although Borish was no longer present in Bloomington after 1982, the fledgling clinical center he was instrumental in creating went on to become a university-wide center for research in optometry and vision

science. In 1994, to honor Borish’s long commitment to clinical research, the School of Optometry faculty voted unanimously to name the center the Borish Center for Ophthalmic Research.

His pioneering vision created an enduring legacy, carried forward into the 21st century as the Borish Center for Ophthalmic Research.

# The first 10 years

## 1995–2005

As Irvin Borish was joining the IU School of Optometry faculty in 1972, Sarita Soni was graduating from the University of Manchester in England and beginning her career as part of a contact lens practice in Manchester. In 1975, she made her way to the IU School of Optometry as a graduate student.

Twenty years later, as a full professor, Soni would be named an inaugural co-director of the Borish Center for Ophthalmic Research. In early fall of 1975, though, she had not yet met the man for whom the center would be named. When she did, she thought she was seeing Einstein.

“I was backing up and literally bumped into him on the first floor of the School of Optometry,” Soni recalls, “and when I did, I muttered ‘I thought he was dead.’ Dr. Borish asked, ‘Who?’, and I replied, ‘Einstein!’ With his longish flowing gray hair, he looked like I imagined Einstein did. Over the years, Dr. Borish often teased me about that meeting.”

Gerald Lowther, also inaugural co-director of the Borish Center, met Irvin Borish in the 1970s as well, while Lowther was a graduate student at Ohio State University. Over years of faculty appointments at Ohio State and elsewhere, Lowther and Borish kept in touch, their relationship deepening when Lowther moved to Indiana University as a faculty member in 1994.

### Founding Mission

*The mission of the Borish Center for Ophthalmic Research is to abet and develop clinical and applied research support and to facilitate investigation of visual disorders, ocular pathologies, and systemic diseases that affect the eye and its adnexa. The center will include development of techniques, procedures, and devices that will enhance visual performance.*

### Founding Goals

- To provide an infrastructure that will promote innovative and challenging clinical investigations and that can respond to requests for information or conduct clinical trials on short notice.
- To create an environment that will encourage multidisciplinary approaches to identifying and solving vision problems.
- To develop strong working relationships with Indiana University, government agencies, industry, professional organizations, practitioners, and the public.
- To develop the premier clinical vision research center that will attract scholars and researchers from around the world.
- To provide an arena for the education of clinical researchers in vision and the training of optometry graduate students, residents, and fellows.



Members of the inaugural Advisory and Administrative Committee and friends of the center. Top row (left to right): Robert D. Yee, MD, PhD; Lew Scott, OD; William Baldwin, OD, PhD; Jerrell S. Simmerman, OD; Donald E. Agostino, PhD; Anthony J. Adams, OD, PhD; Front row: Debbie Freund, PhD; Stanley J. Yamane, OD, PhD; P. Sarita Soni, OD, MS; Irvin M. Borish, OD; Gerald Lowther, OD, PhD; Joan Exford, OD; Robert Houdek, OD



Dr. Borish with his wife, Bea



By the mid-1990s, momentum to establish the Borish Center was well underway. That momentum was fed by various factors, including a shift in the optometry profession toward increased clinical research that would yield enhanced, data-driven vision care as well as changing demands in health care for more efficient and effective services.

In 1993–94, Soni, by then also associate dean for research and graduate education at the IU School of Optometry, began to put together a plan to develop a patient-based research center. Support for this novel idea was garnered from the School of Optometry, the Indiana Chapter of the American Academy of Optometry, IU’s Office of the Vice President for Research, the IU Bloomington campus, and Irvin Borish and his wife.

Professor Sarita Soni with a team of IUSO researchers consisting of (left to right) Kevin Haggerty and Professors Larry Thibos and Doug Horner



Borish Center co-directors  
Gerald Lowther and  
Sarita Soni

Soni and Lowther joined forces to formally propose the Borish Center, which was inaugurated in October 1995 with Soni and Lowther appointed as co-directors.

At the time of its opening, it was the first patient-based research center at IU or any U.S. school or college of optometry. It was particularly notable for its applied research approach that not only enhanced faculty research but also provided an excellent training ground for graduate students.

Approximately 2,000 square feet of space on the second floor of the optometry building was remodeled to accommodate the new center, including three fully equipped examination rooms as well as special testing areas, equipment rooms, laboratories, and patient reception and waiting areas.

This consolidation of research equipment and space was a key benefit of the center, Lowther recalls. The dedicated research space and exam rooms as well as administrative staff support allowed researchers to be more focused and efficient.

“Having both the space and specialized research equipment in one area was very helpful,” he says. “You could quickly move a subject from one piece of testing instrumentation to another. It also allowed researchers access to instrumentation that otherwise they could not afford.”

About two dozen IU vision researchers were associated with the center at its inception. Among them were faculty members Arthur Bradley and Douglas Horner, who both recall the boost that the center’s organization provided to their research.

“The center’s support in managing large patient numbers was helpful,” says Horner. “The center was really useful for patient-based research.”

Likewise, Bradley recalls that the Borish Center provided “an ideal vehicle” for him to perform patient-based research.

“I was not a clinician,” Bradley says, “but the center provided top-quality clinical support and a high-quality research environment for non-clinically trained faculty to perform patient-based research.”

The center readily became a resource not only for the university and the Bloomington area but also for the state and nation. Patients had access to cutting-edge vision care; practitioners had access to information on new procedures; optometry students benefited from exposure to new techniques, procedures, and products; and vision researchers and clinicians collaborated on numerous studies.

In Lowther’s view, the increase in clinically related research stands as a key achievement of the center.

“One of the main reasons for establishing the Borish Center was to answer clinical questions and advance



IU ARCHIVES

eye care developments, procedures, and best practices,” Lowther says. “The large number of diverse studies that have been performed through the center is a highlight.”

For example, in 1995, Lowther became IU’s lead investigator in the Collaborative Longitudinal Evaluation of Keratoconus (CLEK) Observational Study. The study involved 15 sites across the United States and was the first multicenter optometry study funded by the National Eye Institute, a division of the National Institutes of Health. With the support of the center, Lowther was able to follow some 80 patients over many years, revealing new findings about keratoconus, a disease in which the cornea thins and bulges into a cone-like shape.

The first clinical trial initiated at the center in 1995 was a three-year investigation led by Soni and others to study myopia (commonly known as near-sightedness) progression in adolescents. It included 175 children from around Indiana who made visits to the center every six months.

Soni recalls one parent who brought his daughter from Evansville. “We asked why he made the long trips to the



Top, IU School of Optometry

Above, In 1995, (standing, left to right) Arthur Bradley, Charles Watson, Andrya Lowther, David Goss; (seated) Bill Rainey, Douglas Horner

center,” she says. “His response was typical of what we often heard from subjects and their families, that they came because of the reputation of IU research, the reputation of the IU School of Optometry, and the quality of care they received at the center.”

As the center grew, so did its participation in clinical investigations. In 1997, for example, the center was invited to participate in research at the then-new Midwest Proton Radiotherapy Institute regarding age-related macular degeneration, which involved partners from the IU Schools of Optometry and Medicine as well as the IU Cyclotron Facility.

By 1998, Lowther moved to serve as dean of the IU School of Optometry but continued his research at the center. The center continued as well to participate in large-scale clinical trials supported by both the ophthalmic industry and federal funding. A number of these studies had to do with studying the safety and effectiveness of contact lenses. From 1997 to 2011, the Borish Center, in collaboration with Essilor, Inc., was the main U.S. site for clinical investigations of many multifocal spectacle lens designs extensively used all around the world.

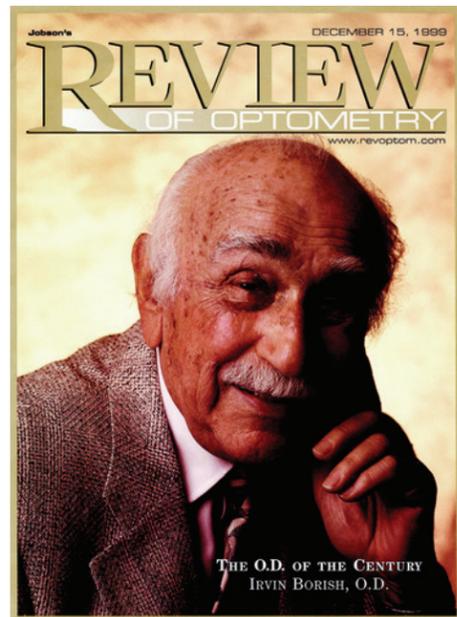
The center’s growing reputation and its facilities and personnel were



Center researchers collect patient data



Above left,  
Above right, Don Lyon examines a pediatric patient



Left, Irvin Borish, honored as OD of the Century in December 1999 by Review of Optometry

instrumental in leading to a major National Institutes of Health–funded investigation in 2000. The project, led by Joseph Bonanno and Soni, studied differences in corneal swelling associated with differences in metabolic activity of the cornea.

In 2000, Tracy Nguyen joined the Borish Center as a research optometrist. She is now an associate clinical professor at the SUNY College of Optometry, where her research focuses on diseases of the cornea. She credits the Borish Center with inspiring that research career.

“It was my first time doing clinical research, and I learned so much about all that is involved,” says Nguyen. “The Borish Center was a launching pad for my career in research, working there really piqued my interest in doing research. I’m very grateful to the center for propelling my career.”

In 2006, administration of the Borish Center changed, with Lowther and Soni moving on from their co-director roles.

Both recall the first 10 years of the center with satisfaction and pride at its accomplishments as a leading center for clinical eye-care research.

“One of the best ways to gauge how the goals were met is the number of research projects conducted through the center,” Lowther says. “And also, the good that was accomplished for subjects and patients who took part in the studies, and the study results that were used by industry and others to improve patient care internationally.”

“I truly believe every goal outlined at the time of the Borish Center’s establishment was met by 2006,” Soni says.

# The second 10 years

## 2005–2015

Shortly before its 10th anniversary, the Borish Center achieved what former director Sarita Soni calls “a major success story” by receiving more than \$600,000 from Indiana University’s Commitment to Excellence (CTE) funding program. As the Borish Center began its second decade, that funding allowed it to continue to capitalize on steady growth.

In particular, the CTE funding supported the recruitment of two faculty members focused on patient-based eye disease research: William Swanson and Shirin Hassan.

Swanson joined the School of Optometry in 2006. His specialty is glaucoma, one of the world’s leading causes of blindness. At IU, he has led ongoing work, steadily funded by agencies such as the National Institutes of Health, to improve methods of screening and testing for the presence, progression, and pattern of damage due to glaucoma.

Swanson credits the Borish Center for providing well-equipped lab spaces that have helped advance his work.

“Coming to the IU School of Optometry and the Borish Center has been really good for my research,” he says.

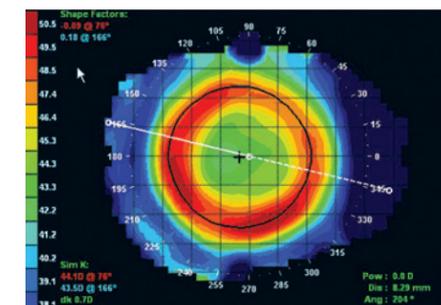
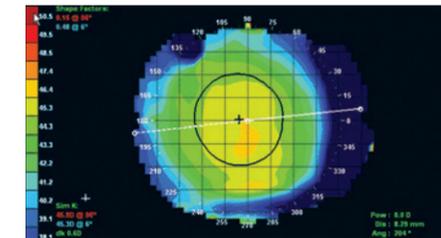
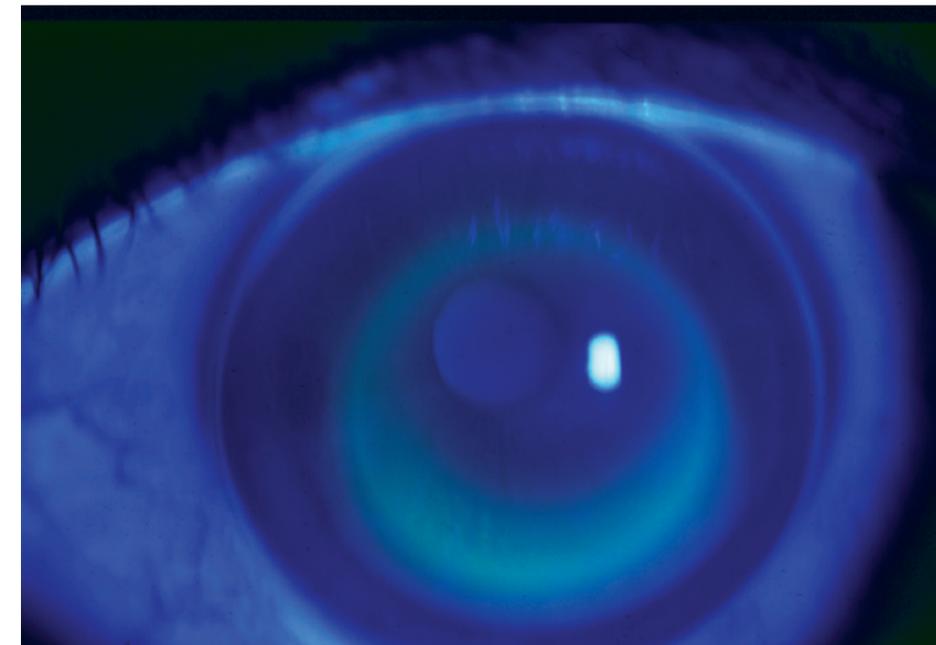
Student acquires a measurement on a fellow student volunteer

Hassan came to IU just after Swanson in 2007, arriving to conduct her patient-centered research. Her work has primarily focused on measuring street-crossing decision-making as well as balance control in normally sighted and visually impaired people.

As a result of Hassan’s research, traffic engineers can design better road and intersection configurations, together with safer, more accessible pedestrian crosswalks for people with low vision and other visual impairments. Her street-crossing research has also helped low-vision optometrists and visual rehabilitation specialists identify patients at risk for making unsafe street-crossing decisions and know when to refer those patients for orientation and street-crossing training.

Likewise, Hassan’s work on balance problems in older adults has provided evidence-based guidelines for referring visually impaired patients for balance training and rehabilitation and guided the development of effective fall prevention strategies specifically designed for people with different types of vision loss.

This impact on vision science as well as the daily lives of those with vision loss would not have been



Left, An orthokeratology lens on the eye

Above, Corneal topography pattern of a typical eye (top) and the same cornea following its flattening with an orthokeratology lens that mechanically flattens the central cornea to reduce myopia (bottom)

possible without the Borish Center’s support, notes Hassan.

“As a practicing low-vision optometrist and researcher, I see the daily struggles of visually impaired people with activities such as crossing streets, being able to read, walking around new neighborhoods, or even recognizing faces,” she says. “People with vision loss want to achieve and maintain independence in their lives, and my clinically applied or translational research has the overall aim of improving their quality of life.

“The Borish Center has provided me with access to equipment that I do not

own in my laboratory,” she continues, “including advanced, and expensive, ophthalmic equipment that I have been able to use in my research. Without access to this equipment, I would not have been able to conduct certain key experiments.”

Swanson and Hassan joined an increasingly busy research center. For most of its second 10 years, the Borish Center was directed by Ann Elsner, now a Distinguished Professor at IU. Elsner moved to IU from the Schepens Eye Research Institute at Harvard University in 2005 and began as center director in July 2006.

During her years as Borish Center director, Elsner oversaw the growing needs of the vision science center, including considerable fiscal oversight demanded by increasing grants, overseeing modernization of space of the center, and obtaining new shared equipment.

For Elsner, the center's shared space and equipment continued to be a signature advantage, providing equipment for testing and research that individual researchers or single research laboratories could not afford to purchase and maintain.

"Shared equipment was and is crucial for succeeding in getting peer-reviewed publications accepted and winning grants," Elsner says. "Having such equipment and space also encourages and builds collaboration, from helping individual researchers learn techniques on the equipment to designing new projects and grants."

Indeed, at the Borish Center, Elsner says, the existence of shared equipment fostered "a culture to share rather than

compete" which "helped researchers make startling discoveries that guide theoretical thinking."

Some of those startling discoveries have been Elsner's own. A leading expert in the study of diabetic retinopathy and macular degeneration, her research has focused on developing retinal imaging and visual function techniques to fight vision loss. This research yielded the discovery that infrared light can be particularly useful in imaging the retina. The innovative technologies Elsner and her colleagues developed revolutionized retinal imaging, revealing structures that had not been seen before in living tissues.

"My research involves devising new techniques, most of it using retinal imaging devices," Elsner says. "Some of these devices were designed and built by me and my collaborators, with smaller devices being placed in the Borish Center."

Elsner's discoveries led her to become the founder and CEO of Aeon Imaging LLC, a Bloomington-based company providing advanced imaging and image display technology for use in medicine and science.

Throughout its second decade, the Borish Center continued to undertake important federal, foundation, and industry funded projects. For founding center faculty member Larry Thibos, the platform provided by the center for connecting with industry was particularly transformative.



Biomicroscopic examination of the eye

"When the Borish Center was established, one of the ideas that came from basic scientists like me was that a clinical research center could attract funding and talent from industry that would expand our scope for solving applied problems that interested industry," Thibos recalls. "Industry tends to be secretive, but we felt that if IU showed itself to be a trusted partner, then we would benefit from the questions posed by industry and the experience of collaboration."

That's exactly what happened for Thibos in the mid-2000s, when a technology called wavefront sensing migrated from astronomy to vision science. For more than 100 years, the optical imperfections that optometry could measure had been narrowly limited. Wavefront sensing technology eliminated this limitation in a flash, enabling a single invisible light to illuminate and then be used to subsequently measure all of the human eye's optical aberrations.

Thibos and his Borish Center colleague Arthur Bradley "envisioned

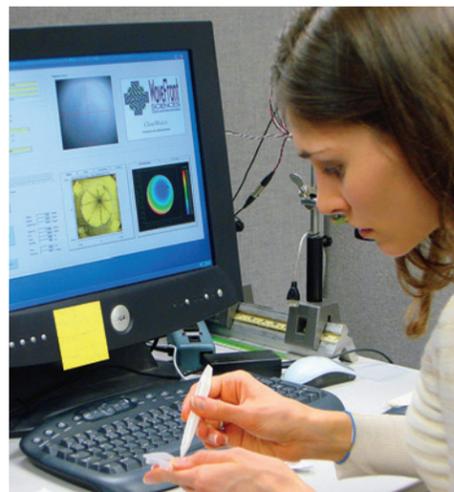
*"{The Borish Center has} contributed to the world's store of knowledge that, in the fullness of time, produced better products that directly benefit the public."*

**Larry Thibos**

rapid acceptance of the wavefront sensor," says Thibos—an idea that was occurring in the vision industry as well. In New Mexico, entrepreneurs had just founded a company, then called Wavefront Sciences, to manufacture a wavefront sensor dubbed an "aberrometer" because it measured the aberrations of the eye.

"With the help of the Borish Center," Thibos says, "a collaboration was established and as a result, at the time the IU School of Optometry became the leading optometric institution in the United States developing aberrometry for improved patient care."

Detailed measurement of the optics of a soft contact lens





Measure of corneal topography

Another long and productive association between the Borish Center and industry occurred with Johnson and Johnson Vision Care (then Vistakon). As Thibos puts it, researchers at the Borish Center offered Vistakon “a path of investigation to understand the most important, pervasive disability in human eyes—myopia.”

With the support of Vistakon and others, Thibos and colleagues made highly detailed investigations into the nature of the eye’s optical defects over a large part of the visual field, not just central vision. They developed a unique type of wavefront aberrometer that could scan a large part of the visual field in a matter of seconds.

“Using that instrument,” Thibos says, “we provided the first detailed description of how the eye’s aberrations vary across the visual field, not only when looking at distant targets, but also when attempting to focus on targets as close as six inches.”

Thibos notes that this discovery is especially relevant today, when questions arise that the constant use of cell phones may lead to a future epidemic of myopia.

Such impactful working relationships with industry partners, government agencies, foundations, and individual researchers and practitioners became the hallmark of the Borish Center for Ophthalmic Research throughout its second decade. This unique blend of clinical and basic research has sustained all aspects of the center’s work, from significant vision science discoveries to high-quality graduate education to cutting-edge patient care.

As Thibos puts it, over the first two decades of its existence, the Borish Center “contributed to the world’s store of knowledge that, in the fullness of time, produced better products that directly benefit the public.”

# 2015 and beyond

**By 2015, the Borish Center (whose namesake, Irvin Borish, had died in March 2012 at age 99) had doubled in size to encompass much of two floors of the IU School of Optometry building and was helping to facilitate all of the school’s patient-based research. The center’s awarded grants totaled nearly \$6 million in 2015.**

Pete Kollbaum had become director in 2014, but he’d been benefitting from the center’s resources for years.

“In the early 2000s, while in graduate school, I was able to work on several Borish Center studies,” Kollbaum recalls. “I learned a lot from these experiences that continues to help me today.”

Kollbaum holds O.D. and Ph.D. degrees from the IU School of Optometry (along with an M.S. from the IU School of Medicine). By the mid-2000s, he was conducting many of his own studies in the Borish Center.

“This was around the same time that the center was expanding to more broadly support all patient-oriented research at the School of Optometry,” Kollbaum says. “Especially early in my career, the fantastic, knowledgeable, supportive staff and top-notch equipment were instrumental to my ability to conduct research.”

Kollbaum’s research expertise centers around visual corrections such as contact, spectacle, or intraocular lenses. Since 2015, his research group has

been working on improved correction of two essential optical problems: the aging eye’s loss of focus over time (presbyopia) and myopia (nearsightedness). To counter the first problem, the group has investigated approaches including pharmaceutical drops, different novel refractive and diffractive designs, and non-static or adaptable lens designs.

The second issue, myopia, is becoming more widespread and severe, Kollbaum notes, resulting in higher risk of eye disease and loss of vision.

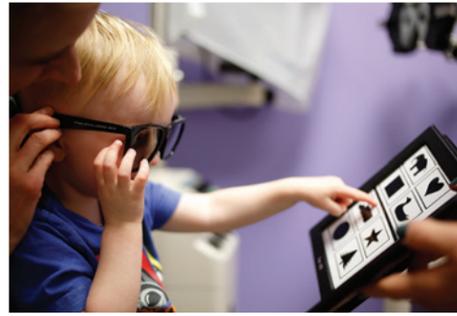
“It’s apparent that many more eyes are developing myopia than 20 to 30 years ago,” Kollbaum says. “About 10 to 15 years ago, people started to realize that it may be possible to slow this problem with optical means. As a result, my team, as well as others around the world, have been working somewhat frantically to try to identify optimized ways to do this, including helping the first lens that slows myopia progression to become FDA-approved.”

Like so many other researchers and clinicians associated with the Borish Center, Kollbaum credits the center’s collaborative ethos for creating the foundation for much of his research accomplishments.

“The center enables research and collaborative opportunities throughout the School of Optometry as well as in the broader community through the efficient use of technological, personnel, and financial resources,” Kollbaum says.

As the center has reached its quarter-century mark, it has continued to support important research with critical clinical applications. In particular, it has helped clinicians busy with patient care to explore novel solutions to problems they and their patients commonly encounter.

Young child performs a test of their stereo vision



Don Lyon's work, for example, is helping to change how amblyopia, commonly called lazy eye, is treated. Amblyopia affects millions of children around the world and is often treated by patching the child's eye. In a multicenter study, Lyon has worked with the startup company Luminopia on testing a novel virtual reality (VR) treatment. The treatment uses a VR headset that presents different visual content to each of a child's eyes to help rebalance the two eyes.

Lyon, who is also director of residencies for the School of Optometry, credits the Borish Center with connecting him to Luminopia. "There are many groups and researchers outside of IU that know of the Borish Center.

The startup's research team initially contacted the center, which then made the introductions. Having the Borish Center as a central research center within the School of Optometry aids researchers in making these connections."

Lyon is also founder and director of Vision for the Future, a program he started with IU colleague Katie Connolly in 2015 to provide advanced-level vision care to Head Start children in six Indiana counties and educate parents and teachers about the importance of early vision care in the life of a child. In 2018, the program began to expand internationally to accomplish similar goals in Rwanda, where access to vision care remains a struggle for many.

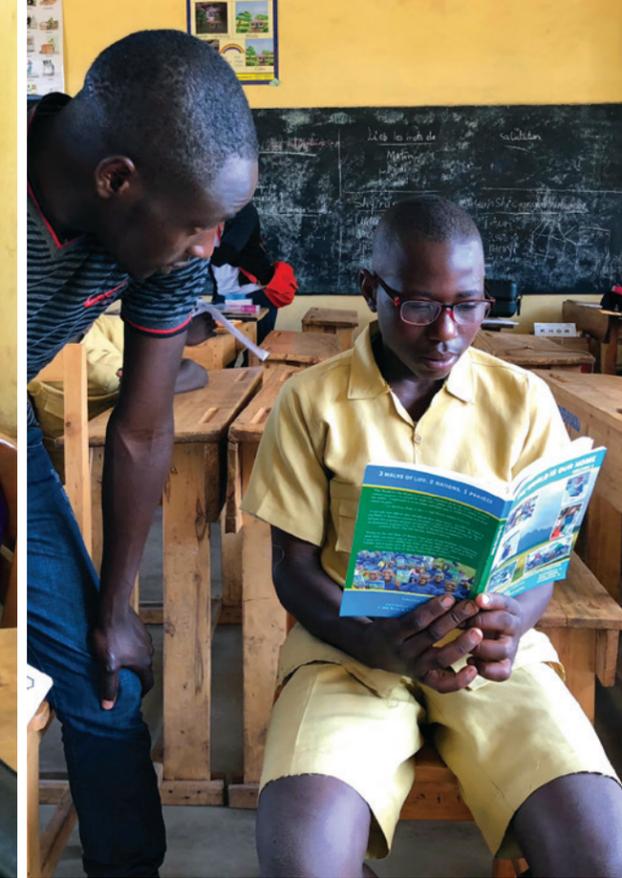
Specifically, during his time in Rwanda, Lyon has provided screenings to more than 250 children and 62 teachers, and also started conversations about bringing optometry education and professional activities to the country.

Lyon notes that as a practicing clinician who also does clinical research, the Borish Center has been invaluable.

"While research is not a mandated component of my faculty position, by having the Borish Center as part of the IU School of Optometry, I have resources and expertise available to me that otherwise I would not," Lyon says. "If the Borish Center was not a part of IUSO, I would not have been as successful in my research career. I owe a great deal to the Borish Center."

Above right, Don Lyon performs a vision screening in Rwanda; a primary school student tries out his new glasses by reading a book

Right, Katie Connolly oversees a clinical examination



*"The Borish Center epitomizes the way research should be done. Clinically based and collaborative research that leads to better scientific outcomes and more efficient progress."*

Pete Kollbaum



A member of Nicholas Port's research team collects data on a participant

IU vision researcher Nicholas Port has been addressing another critical area—concussion and its relationship to vision. In a recent study, Port, an associate professor of optometry, and his research team wanted to look at the possibility that the retina thickens after a concussion. To do that, they needed to use optical coherence tomography, an imaging technique that would allow them to see the retina. The team found the machine they needed at the Borish Center.

“We did a pilot study using the OCT [optical coherence tomography] in the Borish Center,” Port says. “We were fortunate to get enough pilot data to successfully receive a grant from the Indiana Spinal Cord and Brain Injury Research Fund.”

The pilot study yielded suggestive but not conclusive evidence that the retina does thicken following a concussive injury. Port and his team are pursuing a more detailed study, with the ultimate goal of improving the diagnosis and management of concussions for athletes, military personnel, and others—another example of vital research enabled by the Borish Center.

“We would not have considered the pilot study, had we not had free access to the OCT,” Port says. “We could not have done it without the OCT in the Borish Center.”

When the global COVID-19 pandemic hit in 2020, Borish Center work slowed, as it did for organizations and entities around the world. Nevertheless, Kollbaum says, the future of the center looks strong.

“Patient-based translational research—taking ideas developed in a lab, evaluating those ideas safely and efficiently with human subjects, and moving the ideas to the clinic to advance care—is becoming more and more essential,” Kollbaum says. “The Borish Center has done this in many ways over the years, and that work has helped change the way optometry is taught and how doctors care for patients around the world.

“The Borish Center epitomizes the way research should be done,” Kollbaum says. “Collaborating with basic science colleagues to identify potential opportunities of basic discoveries for enhancing patient care, and then working collaboratively through the many necessary patient testing stages to bring that goal to fruition. This basic and clinical science collaborative research leads to better scientific outcomes, more efficient progress, and better patient care.”

In summary, this enduring and productive collaborative model, established 25 years ago in the visionary and creative spirit of Irvin Borish, assures that Indiana University’s Borish Center for Ophthalmic Research will continue meeting the ever-changing needs of vision science and care for many more years to come.



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