

CURRICULUM VITAE OF J. DANIEL TWELKER, OD, PhD

Chronology of Education

University of California, Davis	BA, Spanish	June 1987
University of California, Berkeley	OD	May 1992
University of California, Berkeley Graduate Program in Vision Science	PhD	December 2001
<i>Dissertation Title:</i> "Pterygium Evaluation Project"		
<i>Advisor:</i> Ian L. Bailey, OD, MS		
<i>Major Fields:</i> Vision Science, Public Health, Biostatistics, Epidemiology		

Chronology of Employment

June 1987-August 1988	Research Associate, Department of Ophthalmology, University of California, Davis
September 1992-May 1993	Vision Screening Optometrist, Alameda-CCC Optometric Society
September 1992-August 1995	Optometrist, Michael S. Matthews, OD, San Francisco, CA
August 1995-August 1996	Optometrist, Alameda-CCC Optometric Society
January 1994-December 2001	Optometrist, La Clinica de la Raza, Oakland, CA
August 1996-December 2001	Senior Optometrist, University of California, Berkeley
January 2002-September 2002	Research Assistant Professor, Department of Ophthalmology, University of Arizona
October 2002-Present	Assistant Professor, Department of Ophthalmology, University of Arizona

Honors and Awards

May 1992	Harold Cohn Award for Best OD Thesis in Clinical Research, University of California, Berkeley
July 1996	Distinguished Service Award, University of California, Berkeley
May 1997	Mentored Clinical Scientist, Development Award (K23), National Eye Institute, National Institutes of Health, Bethesda, MD
January 1997	Minnie F. Turner Award, Minnie Flaura Turner Memorial Award

September 1999 William C. Ezell Fellowship, American Optometric Foundation

Service/Outreach

Local/State Outreach

2002-Present	Arizona Optometric Association
2004-Present	Visiting Lecturer, Cow Eye Dissections, 7 th grade Science class, Pistor School, South Tucson, AZ
2004-Present	Visiting Lecturer, Low Vision Optics, UA College of Education
2004	Lions Club Speaker, “Preventing Diabetic Eye Disease”
2006-Present	Interviewer for applicants to the College of Medicine
2007	Job Shadow Organizer for a Visually-Impaired Teenager

National/International Outreach

1995-Present	American Academy of Optometry
1995-Present	Association for Research in Vision and Ophthalmology (ARVO)
2001-2004	ARVO Members in Training Committee, Coordinator for “Pizza with a Prof”

Professional Organizations

1997-Present	Fellow, American Academy of Optometry
--------------	---------------------------------------

Department Committees

2004-Present	Speaker Coordinator, Science of Eye Disease Seminar Series
2004	T32 Training Grant Committee

Publication/Creative Activity (Published or Accepted)

Refereed Journal Articles

1. Johnson CA, Adams AJ, Twelker JD, Quigg JM. Age-related changes in the central visual field for short-wavelength-sensitive pathways. *J Opt Soc Am* 1988;5:2131-2139.
2. Nelson-Quigg JM, Twelker JD, Johnson CA. Response properties of normal observers and patients during automated perimetry. *Arch Ophthalmol* 1989;107:1612-1615.
3. Egashira S, Kish L, Twelker JD, Mutti DO, Zadnik K, Adams AJ. Comparison of cyclopentolate versus tropicamide cycloplegia in children. *Optom Vision Sci* 1993;70:1019-1026.
4. Mutti DO, Zadnik K, Egashira S, Kish L, Twelker JD, Adams AJ. The effect of cycloplegia on measurement of the ocular components. *Invest Ophthalmol Vis Sci* 1994;35:515-527.
5. Twelker JD, Kirschbaum S, Zadnik K, DO Mutti. Comparison of corneal versus through-the-lid A-scan ultrasound biometry. *Optom Vision Sci* 1997;74:852–858.
6. Moore B, Lyons S, Walline J, Harris M, Bartolone A, Kattouf V, Mutti DO, Soni PS, Twelker JD. A clinical review of hyperopia in young children. *JAOA* 1999;70:215-224.
7. *Twelker JD, Bailey IL. Clinical evaluation of pterygium. In: Taylor, HR (ed) Pterygium, pp 57-69. The Hague, The Netherlands: Kugler Publications 2000.
8. *Twelker JD, Bailey IL, Mannis MJ, Satariano WA. Evaluating pterygium severity: A survey of corneal specialists. *Cornea* 2000;19:292-296.

9. *Twelker JD, Mutti DO. Retinoscopy in infants using a near noncycloplegic technique, cycloplegia with tropicamide 1%, and cycloplegia with cyclopentolate 1%. *Optom Vision Sci* 2001;78:215-222.
10. Zadnik K, Manny RE, Yu JA, Mitchell GL, Cotter SA, Quiralte JC, Shipp MD, Friedman NE, Kleinstein RN, Walker TW, Jones LA, Moeschberger ML, Mutti DO, and the CLEERE Study Group. Ocular component data in schoolchildren as a function of age and gender. *Optom Vis Sci* 2003;80:226-236. [NOTE: I am a member of the CLEERE Study Group, as PI of the Tucson CLEERE Site]
11. Kleinstein RN, Jones LA, Hullett S, Kwon S, Lee RJ, Friedman NE, Manny RE, Mutti DO, Yu JA, Zadnik K, CLEERE Study Group. Refractive error and ethnicity in children. *Arch Ophthalmol* 2003;121:1141-1147. [NOTE: I am a member of the CLEERE Study Group, as PI of the Tucson CLEERE Site]
12. Lyons SA, Jones LA, Walline JJ, Bartolone AG, Carlson NB, Kattouf V, Harris M, Moor B, Mutti DO, Twelker JD. A survey of clinical prescribing philosophies for hyperopia. *Optom Vis Sci* 2004;81:233-237.
13. Twelker JD, Harbison SC, Bailey IL. Peripheral light-focusing: Measurement reliability and correlations with ocular dimensions. *Optom Vision Sci* 2005;82:94-100.
14. Mutti DO, Mitchell GL, Hayes JR, Jones LA, Moeschberger ML, Cotter SA, Kleinstein RN, Manny RE, Twelker JD, Zadnik K, CLEERE Study Group. Accommodative lag before and after the onset of myopia. *Investigative Ophthalmol Vis Sci* 2006;47:837-846.
15. Mutti DO, Hayes JR, Mitchell GL, Jones LA, Moeschberger ML, Cotter SA, Kleinstein RN, Manny RE, Twelker JD, Zadnik K and the CLEERE Study Group. Refractive Error, Axial Length, and Relative Peripheral Refractive Error before and after the Onset of Myopia. *Invest Ophthalmol Vis Sci* . 2007 48: 2510-2519.

**Based on work done as a graduate student*

Work in Progress

Twelker JD, Mitchell GL, Messer DH, Bhakta R, Jones LA, Mutti DO, Cotter SA, Kleinstein RN, Manny RE, Zadnik K. An update on ocular component data in schoolchildren as a function of age and gender. Submitted to *Optometry and Vision Science*. Returned recommending major revisions. I am resubmitting with revisions.

Scholarly Presentations

Conferences [Abstracts]

1. *Twelker JD, Chester K, Solorzano JL, Bailey IL. Evaluation of clinical methods for measuring pterygium length. *Invest Ophthalmol Vis Sci* 1999;40:S913.
2. *Twelker JD, Bailey IL. A new questionnaire for evaluating patient symptoms due to primary pterygium. *Optom Vision Sci* 1999;76(Suppl):263.
3. *Twelker JD, Bailey IL. Grading conjunctival hyperemia using a photography-based method. *Invest Ophthalmol Vis Sci* 2000;41(Suppl):S927.
4. *Twelker JD, Mutti DO. Comparison of cyclopentolate versus tropicamide cycloplegia in infants. *Optom Vision Sci* 2000;77(Suppl):113.
5. *Twelker JD, Harbison SC, Bailey IL. Limbal light focusing: Measurement reliability and correlations with ocular dimensions. *Optom Vision Sci* 2001;78(Suppl):53.

6. *Twelker JD, Bailey IL. An age-matched case-control study of risk factors for primary pterygium. *Invest Ophthalmol Vis Sci* 2002;43(Suppl):S3065.
7. *Twelker JD, Bailey IL. Assessing symptoms of primary pterygium. *Optom Vision Sci* 2002;79(Suppl):78.
8. Mutti DO, Hayes JR, Jones LA, Zadnik K, Kleinstejn RN, Manny RE, Yu JA, CLEERE Study Group. Accommodative lag in corrected and uncorrected hyperopia. *Optom Vis Sci* 2002;79(Suppl):196.
9. Zadnik K, Mitchell GL, Mutti DO, Jones LA, Manny RE, Kleinstejn RN, Yu JA, CLEERE Study Group. The ocular components in emmetropes as a function of ethnicity. *Optom Vis Sci* 2002;79(Suppl):197.
10. Zadnik K, Hayes JR, Jones LA, Mutti DO, Mitchell GL, Manny RE, Kleinstejn RN, Yu JA, CLEERE Study Group. Incident myopia and parental history of myopia. *Optom Vis Sci* 2003;80(Suppl):16.
11. Twelker JD, Bailey IL. Sun exposure in unilateral and bilateral pterygium cases. *Invest Ophthalmol Vis Sci* 2003;44(Suppl):S816
12. Mutti DO, Hayes JR, Mitchell GL, Jones LA, Moeschberger ML, Zadnik K, Cotter SA, Kleinstejn RN, Manny RE, Twelker JD, CLEERE Study Group. Axial Length and Ocular Shape before and after the Onset of Myopia *Optom Vis Sci* 2004;81(Suppl):24.
13. Twelker JD, Bhakta RM, Messer DH, Mutti DO, Mitchell GL, Jones LA, Zadnik K, CLEERE Study Group. Gender- and age-specific differences in the ocular components in Southern Arizona school-aged children. *Invest Ophthalmol Vis Sci* 2005;46(Suppl):S.
14. Twelker, JD, Messer DH, Cotter SA, Kleinshein RN, Manny RE, Mutti DO, Hayes JR, Mitchell GL, Jones LA, Moeschberger ML, Zadnik K, CLEERE Study Group. Ocular components as a function of age and gender in school-aged children. *Optom Vis Sci* 2005;82:E-abstract 050037.
15. Twelker, JD. Orígenes de La Miopía, Hipermetropía, y Astigmatismo. Paper presented at the Commencement for the Curso de Experto en Optometría Clínica Avanzada in Madrid, Spain. June 24, 2006. [Invited]
16. Messer DH, Twelker JD, Zadnik K, Mutti DO, CLEERE Study Group. Survey of children's attitudes about their vision and their glasses. Accepted for poster presentation at the Annual Meeting of the American Academy of Optometry, Denver, CO, December 7-10, 2006.
17. Garvey KA, Messer DH, Twelker JD, Manny RE, Cotter SA, Mutti DO, Mitchell GL, Zadnik, CLEERE Study Group. Interobserver repeatability for near phoria measurement using the alternate cover test. Accepted for poster presentation at the Annual Meeting of the American Academy of Optometry, Denver, CO, December 7-10, 2006.

Grants and Contracts

Federal

- 7/1/2001-6/30/2006 70%, PI, U10 EY00893, “Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error (CLEERE),” National Institutes of Health/National Eye Institute, \$1,675,849 [Subcontract through Zadnik, PI at The Ohio State University].
- 7/1/2006-6/30/2011 60%, PI, U10 EY00893, “Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error (CLEERE),” National Institutes of Health/National Eye Institute, \$1,175,956 [Subcontract through Zadnik, PI at The Ohio State University].

Private Foundation

- 5/2002 10%, PI, Pediatric Ophthalmology Research Grant, Knights Templar Eye Foundation, \$30,000.

This is a true and accurate statement of my activities and accomplishments I understand that misrepresentation in securing promotion and tenure may lead to dismissal or suspension under ABOR Policy 6-201J.1.b.

J. Daniel Twelker, OD, PhD
Assistant Professor

Statement of Accomplishments and Objectives on Research, Teaching and Service/Outreach

My work at the University of Arizona Department of Ophthalmology is a mix of patient-based research, teaching medical students and ophthalmology residents, and patient care in the clinic.

Research

Most of my time, perhaps 50%, is spent in patient-based research activities. I am the Principal Investigator of the Arizona site of the Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error (CLEERE). This multi-center study is funded by the National Eye Institute of the National Institutes of Health. The purpose of CLEERE is to better understand normal eye growth and refractive error development in school-aged children. It is during this time, from about 8 to 14 years of age, that many children develop myopia. Evaluation and treatment of myopia in the United States costs somewhere in the region of \$4.8 billion, and includes treatments such as spectacles, contact lenses, and laser eye surgery. Myopia is a risk factor for potentially blinding eye diseases such as retinal detachment and glaucoma.

The Arizona site is responsible for enrolling and examining Native American children from schools in and near the Tohono O’Odham Nation. Almost every Tuesday when school is in session I drive my team to San Xavier, Sells, or Gila Bend to examine up to 24 children per day. I serve as one of the CLEERE examiners by measuring keratometry, intraocular pressure, and crystalline lens power. These are either potential risk factors for the development of refractive error, or important ocular components that make up the eye’s refractive status. I supervise examiners Dawn Messer, OD, MPH and Katie Garvey, OD. Furthermore, I oversee daily operations, data transfer to the Optometry Data Coordinating Center, and manuscript preparation.

In April, 2008, our team will successfully completed our sixth year of data collection, and we have received funding for three more years. The Arizona site has enrolled 808 subjects. In the 2005 to 2006 academic year we examined 574 subjects and 309 (or 54%) of them needed spectacle correction.

I have been a member of the CLEERE Study Group since I became Principal Investigator of the Arizona site in January 2002. In 2003, we published baseline results from the eye examinations of school-aged children from all the Study sites except for Arizona (Zadnik et al., 2003). In addition, we published data concerning the distribution of refractive errors in the various ethnic groups (Kleinstejn et al., 2003). I submitted the manuscript for an update that includes the Ariona results, and it was returned for revisions. I am completing those revisions.

Teaching

I teach six lectures on optics to medical students and Ophthalmology residents. I present the concepts in ways that are easy to understand and remember, so that when the practitioner is in the examination room with the patient, he or she will be able to remember and apply the concepts and practical aspects of optics. For example, instead of presenting a formula to calculate the power of a spectacle lens, I present the concept of vergence of light. Once this concept is understood, the practitioner can make simple calculations in his or her head, instead of memorizing and applying a formula. Fortunately, my efforts have paid off. Of the six residents, all six rated my teaching as very beneficial. Comments were: “Makes optics easy to understand,” “Optics lectures are wonderful and helpful,” and “Dr. Twelker gives the best optics lectures we’ve had.”

In addition to the Departmental teaching assignment, I continue to give lectures on the optics and practical application of low vision aides. This is in the Low Vision and Visual Functioning class of Irene Topor, PhD in the University of Arizona College of Education, Department of Special Education, Rehabilitation and School Psychology. Dr. Topor wrote in a letter, “You went beyond my expectations in what you covered and the material was very informative. I thought your graphics and model added meaning to the concepts that you were teaching the students.”

I have taught seventh graders in an underserved area of Southwest Tucson, although this could also be listed under the Service/Outreach section. I have made several visits to the seventh grade science class of Pistor Middle School. One lecture covered how various ocular disorders such as myopia, cataracts, and macular degeneration affect vision. The next lecture covered the anatomy of the eye and included a cow eye dissection, which in the interest of safety, I performed as a demonstration. Dr. Dorman, the science teacher, wrote, “Your hands-on approach to learning engaged students and aided retention of the covered material.” She wrote, “Your second visit to

Pistor Middle School will always be remembered by each of the 160 students that you taught that day...Sixth grade students are already inquiring about when they will have the chance to meet the now famous "Dr. Dan!"

Service/Outreach

Clinical Service

I spend two days a week examining and treating patients in the University Physicians Eye Clinic at Alvernon. Many of the patients that I examine are children in need of a routine eye examination. I also examine patients who, for one reason or another, have been difficult to refract for glasses. I have a lot of training and experience with refraction, especially for patients with reduced visual acuity due to diabetic retinopathy or age-related macular degeneration, for example. A third specialty niche that I have developed is contact lens fitting. I received extensive training in contact lens fitting in optometry school, and have had years of practical experience in the private practice and University clinic settings. There is only one other practitioner in our large clinical practice that fits contact lenses. It is not uncommon for me to examine three or four patients a day in need of contact lens fitting or evaluation.

The last few years have been challenging for the Department of Ophthalmology and Vision Science. My clinical practice has been consistently able to stay in the black. This is no small feat given the current environment of decreasing reimbursement for services and increasing costs.

Other Service

During 2001 to 2004, I was member of the Association for Research in Vision and Ophthalmology (ARVO) Members-in-Training Committee. ARVO is the largest vision research organization in the United States and internationally. In the past, I have organized an annual event informally called "Pizza with a Prof." This event is an opportunity for about 120 members-in-training to meet any one of 12 to 15 vision researchers over lunch in small round table discussion groups. Organizing this event would usually take 15 to 20 hours a year and consisted of identifying the vision researchers, inviting them to the luncheon, helping them to choose a topic of discussion, and confirming their attendance. Each year I would attend the event to make sure that the food and drink service was going as planned and that the members-in-training and vision researchers were doing well.

In 2004, I gave a lecture to the Tucson Breakfast Lions Club. This Club meets in East Tucson every month. I discussed the detection and prevention of diabetic eye disease. I showed digital images of retinas, some normal and some affected by diabetic retinopathy. I discussed the importance of an annual eye examination and careful blood glucose control for diabetics.

I continue to be responsible for contacting and scheduling the keynote speaker for the Jorge Rodríguez, MD, MPH, Memorial Lectureship. This lecture is part of Department of Ophthalmology Research/Residents' Day, which is both a research symposium and celebration of the graduation of the third year residents. We have had several years of excellent speakers.

Because of my training in epidemiology and biostatistics, I have become an informal consultant in the Department of Ophthalmology and Vision Science. There is a severe

shortage of study design and biostatistical services at the University of Arizona. There are some very experienced experts in the College of Public Health, Cancer Center, and College of Medicine. Unfortunately, these people are extremely busy and are generally not available except on a very limited basis. For this reason, many Ophthalmology residents and even faculty members have used me as a resource for planning their studies and analyzing results. I am happy to provide this service, which only amounts to an hour or two each month.

I interview applicants for the University of Arizona College of Medicine. I find this service to be interesting and it is of help to the College.

I served as an internship committee member for Dawn H. Messer, O.D., M.P.H. Dr. Messer completed the Master's degree in Public Health at the Mel and Enid Zuckerman College of Public Health in December, 2007.

This year, I organized a job shadow experience for a visually-impaired teenager named Dominic who was part of the Arizona School for the Deaf and Blind. Dominic expressed interest in becoming a disc jockey or audio production engineer. I am a volunteer disc jockey for 91.3FM KXCI, a non-profit community radio station. I gave Dominic a tour of the radio station and arranged for a tour with Jennie G. of the commercial radio station 92.9FM KMTN "The Mountain," who initially got her training at KXCI. In the studio, I taught Dominic on-air techniques for station identification, making playlists, and demo recordings.

I participated in a Lions Club International Eye Clinic in Hermosillo, Mexico in the Fall of 2007. In a weekend I examined over 100 patients, rendering eye care and spectacles free-of-charge.