Russell David Hamer

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**Education**

Syracuse University Ph.D. Sensory Neuroscience 1979

Institute for Sensory Research

Ph.D. Thesis: Vibrotactile masking and interaction between sensory channels in the human cutaneous system.

City College of the City

University of New York B.S. Biology 1971

**Professional Experience:**

1978-1982 Post-Doctoral Fellow, Dept. of Psychology, University of Washington, Seattle, WA.

1982-1984 Post-Doctoral Fellow, School of Optometry, University of California, Berkeley, CA.

1984-1985 Research Associate, School of Optometry, University of California, Berkeley, CA.

1984-1986 Research Associate, Smith-Kettlewell Inst. Vis. Sci., M.R.I., San Francisco, CA.

1986-1987 Research Associate, Smith-Kettlewell Eye Research Foundation, San Francisco, CA.

1987-2000 Associate Scientist, Smith-Kettlewell Eye Research Institute, San Francisco, CA.

2000-2006 Scientist, Smith-Kettlewell Eye Research Institute, San Francisco, CA.

2006-present Affiliate Scientist, Smith-Kettlewell Eye Research Institute, San Francisco, CA.

2007-2009 Professor Visitante, Depto. De Psicologia Experimental, Univ. de São Paulo, São Paulo, Brasil

2009-2011 Professor Colaborador, Univ. de São Paulo, São Paulo, Brasil

2011-2013 Professor Visitante, Depto. De Psicologia Experimental, Univ. de São Paulo, São Paulo, Brasil

2014-present Professor Visitante Especial, Depto. De Psicologia Experimental, Univ. de São Paulo, São Paulo, Brasil. Ciência Sem Fronteiras Program, CAPES, Brasil.

2014-2023 Affiliate Research Professor, Dept of Psychology, Florida Atlantic University, Boca Raton, FL

2014-2018 Adjunct Professor, Dept of Psychology, Florida Atlantic University, Boca Raton, FL

2023-present Affiliate Scientist, Smith-Kettlewell Eye Research Institute, San Francisco, CA

**Grants & Awards:**

NEI 5R01EY011513: Computational Analysis of Phototransduction. 1997-2001

NEI Competing: Computational Analysis of Cone Phototransduction 2002-2006

Smith-Kettlewell Eye Research Foundation Grants:

Analysis of Vertebrate Phototransduction Mechanics 1997-1999

Computational Analysis of Phototransduction Mechanisms 2000-2001

Computational Analysis of Phototransduction 2002-2006

William A. Kettlewell Chair Award, $50,000 2000-2005

Visiting Professor Grant from Fundação do Amparo a Pesquisa do Estado de São Paulo

(FAPESP Grant 2007/52321-4), Normal and abnormal visual functions in infants and adults 2007-2008

National institutional interchange Grant (PROCAD/CAPES Grant 182/2007)

Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq Grant 302527/2008-7)

Normal and abnormal vision in infants and adults 2008-2009

Visiting Professor Grant (Pró-Reitoria of Instituto de Psicologia, Universidade de

São Paulo (IPUSP), Grant 2011.1.454.47.0) 2011-2013

São Paulo State Travel Grant (FAPESP, 2012/01654-1) 2012

IPUSP Travel Grant (Pró-Reitoria) 2013

Ciência Sem Fronteiras, Professor Visitante Especial, CAPES 2014-2017

**Editorial Experience**

2008-present. Associate Editor, *Psychology & Neuroscience*

2008-present. Associate Editor, *Psicologia USP*

**Teaching & Lecture Experience:**

February 28, 2023. Lecture at Osher Lifelong Learning Center, Florida Atlantic University, Jupiter, FL Campus: “*Surreal Artist as Visual Neuroscientist: Perceptuo-Cognitive Analysis of Selected Works of René François Ghislain Magritte.*”

April 16, 2020. Invited lecture at Smith-Kettlewell Eye Research Institute, San Francisco, CA: “*Surreal Artist as Visual Neuroscientist: Perceptuo-Cognitive Analysis of Selected Works of René François Ghislain Magritte.*”

April 6, 2020. Invited lecture at the Lifelong Learning Institute, Nova Southeastern University, DavieFL: “*The Timba Revolution: Unparalleled Explosion of Musical Creativity in Modern Cuban Music!*”

Mar. 12- April2, 2020. Weekly lecture series. Osher Lifelong Learning Center, Florida Atlantic University, Boca Raton Campus. “*Artist As Neuroscientist: Analysis of Selected Works of René François Ghislain Magritte.*”

Jan. 27, 2020. Invited lecture at the Institute For Learning In Retirement, Boca Raton, FL: “*The Timba Revolution: Unparalleled Explosion of Musical Creativity in Modern Cuban Music!*”

Nov. 20, 2019. Invited lecture at Broward College, Davie, FL: “*What Art Tells Us About The Human Brain (and vice versa): Perceptuo-Cognitive Analysis of Selected Works of René François Ghislain Magritte*”

Nov. 4, 2019. Invited lecture at the Institute For Learning In Retirement, Boca Raton, FL: “*What Art Tells Us About The Human Brain (and vice versa): Perceptuo-Cognitive Analysis of Selected Works of René François Ghislain Magritte*”

2017-present. Graduate Neuroscience 2 course, Sections on Retinal & Central Vison, through the *Center for Complex Systems & Brain Sciences*, Florida Atlantic University.

2015-2016. Spring & Fall Semesters teaching General Psychology, undergraduate program through *Navitas*, Florida Atlantic University.

2013. Six-week graduate seminar “Psicologia, Neurociência e Valores Humanos” (*Psychology, Neuroscience and Human Values*). The seminar class delved into the critical role that the brain sciences – psychology, neuroscience, sensory-perceptual science – have in the evolution of our shared human values and morals. The thesis that a complete and rich ethical and moral structure can be derived from, based on, knowledge derived from evidence based science, and that knowledge of the locus of morals and ethics - the human brain – is paramount in the endeavor.

2011, 2012, 2013. Six-week intensive graduate seminar “*Desenvolvimento Visual*” (“*Visual Development*”) was offered in all 3 years. Review of the structure and function of the visual system and critical developmental milestones. Functional vision topics covered: development of visual acuity, contrast sensitivity, color vision, sensitivity to motion, binocular vision, challenges to normal visual development, higher perceptual-cognitive development.

August 17, 20, 2012. Graduate mini-course “*Estratégias Retinianas de Codificação Visual - III*”. (“*Retinal strategies of visual coding - III*”) Taught with visiting Prof. Henrique von Gersdorff (The Vollum Institute, Oregon Health & Science University) and Profa. Christina Joselevitch (IPUSP).

August 19, 22, 2011. Graduate mini-course “*Estratégias Retinianas de Codificação Visual - II*”. (“*Retinal strategies of visual coding - II*”) Taught with visiting Prof. David Zenisek (Yale University School of Medicine, USA) and Profa. Christina Joselevitch (IPUSP).

August 20 – December 3, 2010. Graduate course “*Psicologia Sensorial*”. (“Sensory Psychology”). Taught with Profas. Christina Joselevitch (IPUSP) and Mirella Gualtieri (IPUSP). Essential topics in sensory neuroscience spanning all sensory systems were presented, including hands-on lab experience in electrophysiological and psychophysical methods. Student class participation and critical analysis of research articles was required.

November 22, 24, 2010. Graduate mini-curso “*Técnicas de preparação de Trabalhos Científicos – Apresentação Oral de Trabalhos Científicos*.” (“*Techniques* *for oral presentation of scientific research*”) With Profa. Christina Joselevitch (IPUSP). Methods to optimize effective scientific presentations are discussed with student participation. This course was also offered in 2011, 2012, 2013.

August 20, 23, 2010. Graduate mini-course “*Estratégias Retinianas de Codificação Visual - I*”. (“*Retinal strategies of visual coding - I*”) Taught with visiting Prof. Maarten Kamermans (Netherlands Institute for Neuroscience, Netherlands) and Profa. Christina Joselevitch (Instituto de Psicologia, Universidade de São Paulo, IPUSP).

July, 2010. Graduate mini-course “*Medidas com PVE de varredura do processamento de vernier é consistente com a dominância das respostas magnocelulares*.” (“*Sweep VEP measurements of vernier processing is consistent with dominance by magnocellular responses*.”) This class introduced students to human vernier (high-precision spatial localization) processing and the use of visual evoked potentials in measuring vernier responses.

June, 2010. Graduate mini-course “*Desenvolvimento do processamento de movimento: novos paradigmas para o estudo dos mecanismos de movimento indisponíveis para análise no sistema visual do adulto.” (“Development of motion processing: new paradigms to study motion mechanisms unavailable for analysis in the adult visual system*.”) This class summarized the key features of motion processing in both normal and abnormal development. The content focused on results from visual evoked potentials in response to periodic motion (MVEPs). A new VEP paradigm with which to study development of both motion and pattern (contrast) processing (from a single MVEP waveform) was introduced.

March 17 – June 09, 2010. Graduate course, “*Fisiologia e Fototransdução em Fotorreceptores de Vertebrados – História e Problemas Atuais Revelados por Técnicas Genéticas Modernas e Modelamento Computacional*”. (“*Physiology and phototransduction in vertebrate photoreceptors – history and problems revealed by modern genetic methods and computational modeling*”.) Presented to students at Instituto de Psicologia, Universidade de São Paulo in São Paulo, Brasil, and to students at the Federal University of Pará (Universidade Federal do Pará), in Belém, Pará, Brasil (by videoconference). The course introduced retinal function, especially photoreceptor function, and illustrated the use of computational modeling in understanding this complex biological system.

2009 – 2013. *Orientador (Graduate Advisor), co-orientador*, *Laboratorio de Psicologia Experimental, Instituto de Psicologia, Universidade de São Paulo (USP), São Paulo, Brasil* . I was an advisor for two Masters (Mestrado) students, Fabio A. Carvalho and Marina Von Zuben de Arruda Camargo, and a co-advisor, with Professor Marcelo F. Costa, for a Ph.D. student, Valtenice C.R.M França. All three have since obtained their respective degrees, and one is in a Post-Doctoral program at USP.

2009 – 2011. *Professor Colaborador*, Departamento de Psicologia Experimental, Instituto de Psicologia, Universidade de São Paulo, *São Paulo, Brasil*. Courses included: Visual Development, Visual Evoked Potential Methods in Visual Neuroscience, Essential Math and Analysis For Visual Neuroscience Research, Vertebrate Photoreceptor Physiology and Phototransduction, Sensory Psychology.

2007 – 2008. *Professor Visitante, Laboratorio de Psicologia Experimental, Instituto de Psicologia, Universidade de São Paulo, Sau Paulo, Brasil*. In early 2007 I had the honor of being invited to become a Visiting Professor at the University of São Paulo in the Psychology Department. My first semester, I taught visual physiology and perception to graduate students in the Psychology Department with an emphasis on five topics: (1) physiology and phototransduction in vertebrate photoreceptors; (2) visual development in human infants, including development of grating acuity, contrast sensitivity and motion responses; (3) behavioral and swept parameter VEP methods for measuring visual function, including a primer on frequency domain analyses; (4) Introduction to human temporal contrast processing, including a second primer on frequency domain vs temporal domain analysis; (5) The course concluded with an open seminar on “*Ethics & Animal Research*” which I designed and guided. By invitation of Dra. Dora F.Ventura, head of the Laboratorio da Visão at the Insituto de Psicologia.

2008 1st semester. Taught undergraduates in a lab-based course on measurement of visual function using sweep VEP and Teller Acuity cards applicable to research with infants or adults.

July, 2007. Postgraduate level class in visual physiology and photoreceptor function, phototransduction. By invitation of Professor Luiz Carlos L. Silveira, professor at the Centro de Ciências Biológicas, Departamento de Fisiologia at the Universidade Federal do Pará in Belém.

2004 – 2006. *Preceptor to a Postdoctoral Fellow*, Dr. Ali Navid. As Dr. Navid’s preceptor, my role was to teach and train him to help promote his success in a scientific research career. I spent many hours teaching him about our field, about visual neuroscience, about how to write up scientific results for submission to per-review journals and about how to write research grant proposals.

Fall, 1994. *Guest lectures in the sophomore science class* (Frank Daar, teacher) at Arrowsmith Academy, Berkeley, CA. Taught a class on the human senses, focusing on vision, visual perception, visual illusions and the lessons these carry for an appreciation of the complexities of the human experience and the biologically-based characteristics that transcend cultures and bind us to each other.

1986 – 1995. *Monthly lectures to parents groups* at Kaiser Hospital and California Pacific Medical Center, SF, CA, educating parents about normal and abnormal visual development of infants.

Summer, 1984. *Introduction to Bioengineering*. College preparatory summer course for advanced placement minority high school students at the School of Optometry, University of California, Berkeley. I taught these bright HS students the basics in the anatomy, physiology and perceptual psychology of hearing, vision and the cutaneous senses, with the major emphasis on vision. Towards the end of the unit on visual perception and the physiological basis of some well-known perceptual illusions, we did a field trip to local art museums to help link the academic material with real-world perception and esthetic experience.

1980-1981 *Graduate Seminar in Systems Neuroscience*, Departments of Psychology and Electrical Engineering. This was a high-level seminar course co-taught by me and Dr. Robert Pinter from the College of Engineering. Students were guided through reading of and evaluation of significant new scientific papers in the field of visual neuroscience.

1976 – 2006. *Scientific invited lectures, presentations & colloquia*. As a central part of my scientific career, I have given innumerable talks and lectures and presentations at conferences and universities around the world (see Scientific Abstracts below). I thus have had an enormous amount of experience in organizing complex material in a manner that is clear and communicative and interesting, and most importantly, understandable by diverse audiences with different backgrounds and levels of expertise.

**Training & Credentialing**

California Basic Educational Skills Test (CBEST), Oct. 7, 2006.

Registered member of Association for Supervision and Curriculum Development (ASCD).

Credentialed by Florida Department of Education to teach Biology, Grades 6-12. January, 2018.

**Multicultural & Artistic Activities**

Languages: English, Portuguese, Functional Spanish

1992 – 2018. Taught Cuban and Miami-style Salsa dance to all levels of dancers. Taught weekly classes in San Francisco, Emeryville, and Santa Cruz, CA, plus workshops in Arizona, Washington State, Brisbane & Sydney, Australia, Losone, Switzerland (1992 – 2006). Weekly classes in Salsa taught in Portuguese and Spanish at the Universidade de São Paulo, SP, Brasil (2007-2013). Choreographed dance performances.

1992 – 2018. *Salsa dance instruction*. I have taught thousands of students Cuban & Miami-style Salsa dance, including classes of pre-teens. I taught Salsa and Rueda de Casino at the *Rhythm & Motion Studios* and *Dance Mission Theater* in SF, and at the *The Beat Studio* in Berkeley, CA. I have taught classes in San Francisco Bay Area public schools, and taught a large class of Napa High-School (which has national award-winning Jazz and Pom dance teams!) students for 3 months in 2004. They learned Salsa from scratch, and learned a complicated choreography to perform at their annual dance performance extravaganza. I have also taught classes all over northern California, in Seattle, WA, Vancouver, Canada, Tucson and Phoenix, AZ as well as in Switzerland, Australia and (for 6 years), at the Universidade de São Paulo, SP Brasil between 2007 and 2013. In the Summer of 2006, I taught Salsa to an all-girls’ (ages 11-13) soccer team in Alameda, CA. I also choreographed Salsa and Rueda performances for dancers in the San Francisco Bay area that were performed in local Dance Studios and cultural festivals, as well as a choreography for a University-wide competition at the Universidade de São Paulo (which has more than 50,000 students). That choreography won 1st prize.

2014 – present. I have been analyzing the surreal art of Rene Magritte from the point of view of what his paintings can reveal about visual processing in the brain. The surreal effects he creates provide clues about the hierarchy processing of objects in 2D representation on a canvas of a 3D scene. Magritte carefully constructs objects and space in his works, then proceeds to violate the space he so meticulously constructed. The result is a surreal confounding of figure *vs* background, perceptual distortions of familiar objects induced by our visual system’s attempts to reconcile conflicting cues. Open spaces become occluding objects. In Magritte’s world, the same object can be perceived as either opaque or a transparent opening.

**Scientific Publications:**

Gescheider GA, Verrillo RT, Capraro AJ, Hamer RD. (1977) Enhancement of vibrotactile sensation magnitude and predictions from the duplex model of mechanoreception. *Sensory Processes* **1**(3):187-203.

Gescheider GA, Capraro AJ, Frisina RD, Hamer RD, Verrillo RT (1978) The effects of a surround on vibrotactile thresholds. *Sensory Processes* **2**(2): 99-115.

Hamer RD, Alexander KR, Teller DY. (1982) Rayleigh discriminations in young human infants. *Vision Res*.; **22**(5): 575-577. <https://doi.org/10.1016/0042-6989(82)90116-x>

Hamer RD, Verrillo RT, Zwislocki JJ. (1983) Vibrotacile masking of Pacinian and non-Pacinian channels. *J Acoust Soc Am*.; **73**(4): 1293-303. <https://doi.org/10.1121/1.389278>

Enoch, JM and Hamer, RD (1983) Image size correction of the unilateral aphakic infant. *Ophthalmic Pediatrics and Genetics* **2**:153-165. <https://doi.org/10.3109/13816818309007806>

Hamer RD, Schneck ME. (1984) Spatial summation in dark-adapted human infants. *Vision Res*.; **24**(1): 77-85. <https://doi.org/10.1016/0042-6989(84)90146-9>

Schneck ME, Hamer RD, Packer OS, Teller DY. (1984) Area-threshold relations at controlled retinal locations in 1-month-old infants. *Vision Res.* **24**(12):1753-63.

Hamer RD, Dobson V, Mayer MJ. (1984) Absolute thresholds in human infants exposed to continuous illumination. *Invest Ophthalmol Vis Sci*.; **25**(4): 381-388.

Hamer, RD, Yasuma, T, Lakshminarayanan, V, Enoch, JM, , Birch, DG, Birch, EE (1985) Stiles-Crawford functions are not broader after one week of total light exclusion. Presented at the First Topical Meeting on Noninvasive Assessment of the Visual Function, Optical Society of America, Incline Village, Nevada, March 19-20, 1985. Published Abstract in The Technical Digest. <https://doi.org/10.1364/NAVF.1985.WA7>

Hamer, RD, Cohn, TE. (1985). Visibility of suprathreshold targets. Presented the Optical Society of America Annual Meeting. <http://dx.doi.org/10.1364/OAM.1985.WF5>

Yasuma, T, Hamer, RD, Lakshminarayanan, V, Enoch, JM and O'Donnell, JJ (1986) Retinal receptor alignment and directional sensitivity in a gyrate atrophy patient. *Clin. Vis. Sci*. **1**:93-102.

Hamer, R.D., Lakshminarayanan, V., Yasuma, T., Enoch, J.M. and O'Donnell, J.J. (1986) Selective adaptation of the Stiles-Crawford function in patient with gyrate atrophy. *Clin. Vis. Sci*. **1**:103-106.

Tyler, CW, Norcia, AM & Hamer, RD. (1987). Two Mechanisms Revealed by Sweep VEP Contrast Functions in Infants, in *Topical Meeting on Noninvasive Assessment of the Visual System, Technical Digest Series (Optica Publishing Group), paper MB2*.  
<https://opg.optica.org/abstract.cfm?URI=NAVS-1987-MB2>

Enoch, JM, Hamer, RD, Lakshminarayanan, V, Yasuma, T, Birch, DG and Yamade, S. (1987) Effect of monocular light exclusion on the Stiles-Crawford function. *Vision Res*. **27**:507-510. <https://doi.org/10.1016/0042-6989(87)90035-6>

Pagon RA, Chatrian GE, Hamer RD, Lindberg KA. (1988) Heterozygote detection in X-linked recessive incomplete achromatopsia. *Ophthalmic Paediatr Genet*. **9**(1): 43-45. <https://doi.org/10.3109/13816818809031480>

Norcia AM, Tyler CW, Hamer RD. (1988) High visual contrast sensitivity in the young human infant. *Invest Ophthalmol Vis Sci*.; **29**(1): 44-49.

Norcia AM, Tyler CW, Hamer RD, Wesemann W. (1989) Measurement of spatial contrast sensitivity with the swept contrast VEP. *Vision Res*.; **29**(5): 627-637. <https://doi.org/10.1016/0042-6989(89)90048-5>

Hamer RD, Norcia AM, Tyler CW, Hsu-Winges C. (1989) The development of monocular and binocular VEP acuity. *Vision Res*.; **29**(4): 397-408. <https://doi.org/10.1016/0042-6989(89)90004-7>

Hsu-Winges C, Hamer RD, Norcia AM, Wesemann H, Chan C. (1989) Polaroid photorefractive screening of infants. *J Pediatr Ophthalmol Strabismus* **26**(5):254-260. <https://doi.org/10.3928/0191-3913-19890901-12>

Norcia AM, Tyler CW, Hamer RD. (1990) Development of contrast sensitivity in the human infant. *Vision Res*.; **30**(10): 1475-86. <https://doi.org/10.1016/0042-6989(90)90028-j>

Tyler, C.W. and Hamer, R.D. (1990) Analysis of visual modulation sensitivity IV. Validity of the Ferry-Porter law. *J. Opt. Soc. Am.A 7*, 743-758. <https://doi.org/10.1364/josaa.7.000743>

Lasley DJ, Hamer RD, Dister R, Cohn TE. (1991) Postural stability and stereo-ambiguity in man-designed visual environments. *IEEE Trans Biomed Eng*. **38**(8):808-813. <https://doi.org/10.1109/10.83593>

Norcia, A.M., Garcia, H., Humphry, R., Holmes, A., Hamer, R.D. and Orel-Bixler, D. (1991). Anomalous motion VEPs in infants and in infantile esotropia. *Invest. Ophthalmol. Vis. Sci. 32*, 436-439.

Hamer RD, Tyler CW (1992) Analysis of visual modulation sensitivity. V. Faster visual response for G- than for R-Cone pathway? *J. Opt. Soc. Am.A* *, 9*, 1889-1904. <https://doi.org/10.1364/josaa.9.001889>

Hamer RD, Tyler CW (1992) Isolation of R-Cone Response with red light *Invest. Ophthalmol. Vis. Sci. 33(4)*, 704.

Hamer RD, Norcia AM, Day SH, Haegerstrom-Portnoy G, Lewis D, Hsu-Winges C. (1992) Comparison of on- and off-axis photorefraction with cycloplegic retinoscopy in infants. *J Pediatr Ophthalmol Strabismus*; **29**(4): 232-239. <https://doi.org/10.3928/0191-3913-19920701-11>

Hansen, R.M., Hamer, R.D. and Fulton, A.B. (1992). The effect of light adaptation on scotopic spatial summation in 10-week-old infants. *Vis. Res. 32*, 387-392. <https://doi.org/10.1016/0042-6989(92)90147-b>

Hamer, R.D., Norcia, A.M., Orel-Bixler, D. and Hoyt, C.S. (1993) Motion VEPs in late-onset estropia. *Clin. Vis. Sci. 8,* 55-62.

Tyler, C.W. and Hamer, R.D. (1993) Eccentricity & the Ferry-Porter law. *J. Opt. Soc. Am. A,10*, 2084-2087. <https://doi.org/10.1364/josaa.10.002084>

Hamer, R.D. and Mayer, D.L. (1994) The development of spatial vision. In: Principles and Practice of Ophthalmology, Chapter 42, Albert DM, Jakobiec FA (Eds.), W.B. Saunders Co., Philadelphia, PA., pp. 578-608.

Jampolsky A, Norcia AM, Hamer RD (1994) Preoperative alternate occlusion decreases motion processing abnormalities in infantile esotropia. *J. Ped. Ophthalmol. Strab. 31*, 6-17. <https://doi.org/10.3928/0191-3913-19940101-04>

Hamer RD, Norcia AM (1994) The development of motion sensitivity during the first year of life. *Vis. Res. 34*, 2387-2402. <https://doi.org/10.1016/0042-6989(94)90283-6>

Tyler CW, Hamer RD. (1995) Photokinetic analysis of primate cone responses implies qualitative differences from rod transduction. *Vis. Sci. and Its Appl., Technical Digest Series, Opt. Soc. Am.* **1**: 260-263. <https://doi.org/10.1364/VSIA.1995.MA1>

Hamer RD, Tyler CW (1995) Phototransduction: modeling the primate cone flash response. *Visual Neuroscience 12*, 1063-1082. <https://doi.org/10.1017/s0952523800006726>

Norcia, AM, Hamer RD, Jampolsky, A, Orel-Bixler, D (1995) Plasticity of human motion processing mechanisms following surgery for infantile esotropia. *Vis. Res. 35*, 3279-3296. <https://doi.org/10.1016/0042-6989(95)00144-4>

Hamer, R.D. and Tyler, C.W. (1996) Rising phase of rod phototransduction is fitted by a linear model of the molecular cascade with no absolute delay. *Vision Science and Its Applications, Tech. Digest Series, Opt. Soc. Am. 1*, 56-59.

Hamer, R.D. (2000a). Computational analysis of vertebrate phototransduction. Combined quantitative & qualitative modeling of dark- and light-adapted responses in amphibian rods. *Visual Neuroscience* *17*, 679-699. <https://doi.org/10.1017/s0952523800175030>

Hamer, R.D. (2000b). Analysis of Ca++-dependent gain changes in PDE-activation in vertebrate rod phototransduction . *Molecular Vision 6,* 265-286. [PDF](http://www.molvis.org/molvis/v6/a36/).

Hamer, R.D., Nicholas, S.C., Tranchina, D. & Liebman, P.A. (2002). On the reproducibility of single photon responses (SPRs): the Gordian knot of rod phototransduction perseveres. *Journal of Vision* *10*: 113a. doi: 10.1167/2.10.113 [WebLink](http://www.journalofvision.org/content/2/10/113).

Hamer, R.D., Nicholas, S.C., Tranchina, D., Lamb, T.D & Liebman, P.A. (2003) On the reproducibility of rod single-photon responses: The Gordian knot of phototransduction unravelled. *Perception* *32*: 38-38. ECVP Abstract Supplement: Suppl. S. [WebLink](https://www.researchgate.net/publication/295417293_On_the_reproducibility_of_rod_single-photon_responses_The_Gordian_knot_of_phototransduction_unravelled#fullTextFileContent)

Hamer, R.D., Nicholas, S.C., Tranchina, D., Liebman, P.A. & Lamb, T.D. (2003). Multiple steps of phosphorylation of activated rhodopsin can account for the reproducibility of vertebrate rod single-photon responses. *Journal of General Physiology, 122*: 377-402. <https://doi.org/10.1085/jgp.200308832> [PDF](http://www.jgp.org/cgi/content/full/122/4/419)

Hamer, RD, Nicholas, SC, Tranchina, D, Lamb, TD & Jarvinen, JLP. (2005) Towards a unified model of vertebrate rod phototransduction. *Visual Neuroscience, 22*: 417-436. [PDF](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1482458/pdf/nihms-6018.pdf)

Navid, A, Nicholas, SC, Hamer RD. (2006) A proposed role for all-trans retinal in regulation of rhodopsin regeneration in human rods. *Vision Research, 46*: 4449-4463. <https://doi.org/10.1016/j.visres.2006.07.035>

Gualtieri, M, Bandeira, M, Hamer, RD, Costa, MF, Oliveira, AGF, Sadun, F, De Negri, AM, Berezovsky, A, Salomão, SR, Carelli ,V, Sadun, AA, Ventura, DF. (2008). Psychophysical analysis of contrast processing segregated into magnocellular and parvocellular systems in asymptomatic carriers of 11778 Leber’s Hereditary Optic Neuropathy. *Visual Neuroscience* *25*: 469-474. [PubMed](http://www.ncbi.nlm.nih.gov/pubmed/18598420) [PDF](https://www.researchgate.net/publication/5253848_Psychophysical_analysis_of_contrast_processing_segregated_into_magnocellular_and_parvocellular_systems_in_asymptomatic_carriers_of_11778_Leber%27s_hereditary_optic_neuropathy)

Moura, ALA, Teixeira, RAA, Oiwa, NN, Costa, MF, Feitosa-Santana, C, Callegaro, D, Hamer, RD, Ventura, DF. (2008). Chromatic discrimination losses in multiple sclerosis patients with and without optic neuritis using the Cambridge color test. *Visual Neuroscience 25*: 463-468. [PubMed](http://www.ncbi.nlm.nih.gov/pubmed/18598419) [PDF](https://www.researchgate.net/publication/5253847_Chromatic_discrimination_losses_in_multiple_sclerosis_patients_with_and_without_optic_neuritis_using_the_Cambridge_Colour_Test).

Hamer, RD & Norcia, AM (2009) The Jitter Spatial Frequency Sweep VEP: a new paradigm to study spatiotemporal development of pattern- and motion-processing mechanisms in human infants. *Psychology & Neuroscience 2:* 163-177. [PDF](https://psycnet.apa.org/fulltext/2011-14939-008.pdf)

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**References**

*Professional References (USA)*

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