

Russell David Hamer

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EDUCATION

Syracuse University
Institute for Sensory Research
Ph.D. Thesis: Vibrotactile masking and interaction between sensory channels in the human cutaneous system.

Ph.D. Sensory Neuroscience	1979
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City College of the City
University of New York

B.S. Biology	1971
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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-present	Affiliate Research Professor, Dept. Of Psychology, Florida Atlantic University, Boca Raton, FL
2016-2017	Adjunct Professor, Navitas, Florida Atlantic University, Boca Raton, FL

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
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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
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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:

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.

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.

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.

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.

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.

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 peer-review journals and about how to write research grant proposals.

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.

2007 – 2008. *Professor Visitante, Laboratorio de Psicologia Experimental, Instituto de Psicologia, Universidade de São Paulo, São 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 Instituto 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.

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.

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.

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.

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.

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.

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).

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 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 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).

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.

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.

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

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

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, Basic Spanish

1992 – present. 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 – present. *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.

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.
- Hamer RD, Verrillo RT, Zwislocki JJ. (1983) Vibrotactile masking of Pacinian and non-Pacinian channels. *J Acoust Soc Am.*; **73**(4): 1293-303.
- Enoch, JM and Hamer, RD (1983) Image size correction of the unilateral aphakic infant. *Ophthalmic Pediatrics and Genetics* **2**:153-165.
- Hamer RD, Schneck ME. (1984) Spatial summation in dark-adapted human infants. *Vision Res.*; **24**(1): 77-85.
- 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, Lakshminarayanan, V, Enoch, JM, Yasuma, T, 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.
- 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. [PDF](#)
- 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.
- Enoch, JM, Hamer, RD, Lakshminarayanan, V, Yasuma, T, Birch, DG and Yamada, S. (1987) Effect of monocular light exclusion on the Stiles-Crawford function. *Vision Res.* **27**:507-510.
- Pagon RA, Chatrian GE, Hamer RD, Lindberg KA. (1988) Heterozygote detection in X-linked recessive incomplete achromatopsia. *Ophthalmic Paediatr Genet.* **9**(1): 43-45.
- 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.
- Hamer RD, Norcia AM, Tyler CW, Hsu-Winges C. (1989) The development of monocular and binocular VEP acuity. *Vision Res.*; **29**(4): 397-408.
- 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.
- Norcia AM, Tyler CW, Hamer RD. (1990) Development of contrast sensitivity in the human infant. *Vision Res.*; **30**(10): 1475-86.
- 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.
- 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.

- 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.
- Hamer RD, Norcia AM, Day SH, Haegerstrom-Portnoy G, Lewis D, Hsu-Winges C. (1992) Comparison of on- and off-axis photorefractive cycloplegic retinoscopy in infants. *J Pediatr Ophthalmol Strabismus*; 29(4): 232-239.
- 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.
- Hamer, R.D., Norcia, A.M., Orel-Bixler, D. and Hoyt, C.S. (1993) Motion VEPs in late-onset esotropia. *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.
- 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.
- Hamer RD, Norcia AM (1994) The development of motion sensitivity during the first year of life. *Vis. Res.* 34, 2387-2402.
- 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.
- Hamer RD, Tyler CW (1995) Phototransduction: modeling the primate cone flash response. *Visual Neuroscience* 12, 1063-1082.
- 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.
- 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. [PubMed](#)
- Hamer, R.D. (2000b). Analysis of Ca⁺⁺-dependent gain changes in PDE-activation in vertebrate rod phototransduction. *Molecular Vision* 6, 265-286. [PDF](#).
- 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](#).
- 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. ECVF Abstract Supplement: Suppl. S. [WebLinkAbstr.](#)
- 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. [PDF](#)
- Hamer, RD, Nicholas, SC, Tranchina, D, Lamb, TD & Jarvinen, JLP. (2005) Towards a unified model of vertebrate rod phototransduction. *Visual Neuroscience*, 22: 417-436. [PubMed](#)
- 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. [PubMed](#)
- 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](#) [PDF](#)

- 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](#) [PDF](#).
- 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](#)
- Costa MF, Moreira SM, Hamer RD, Ventura DF. (2010) Effects of age and optical blur on real depth stereoacuity. *Ophthalmic Physiol Opt.* 30:660-666. [PDF](#)
- Gualtieri M, Bandeira M, Hamer RD, Damico FM, Moura ALA, Ventura DF. (2011) Contrast sensitivity mediated by inferred magno- and parvocellular pathways in type 2 diabetics with and without non-proliferative retinopathy. *Invest Ophthalmol. Vis Sci.* 52: 1151-1155. [PubMed](#)
- Bogusz S, Hantao LW, Braga SCGN, França VCRM, Costa MF, Hamer RD, Ventura DF, Augusto F. (2012). Solid-phase microextraction combined with comprehensive two-dimensional gas chromatography for fatty acid profiling of cell wall phospholipids. *Journal of Separation Science* 35: 2438-2444.
- Hamer RD, Carvalho, FA & Ventura DF. (2013). Effect of contrast and gaps on sweep VEP measurement of human cortical vernier responses. *Psychology & Neuroscience*.6(2): 199-212. [PDF](#)
- Costa TL, Hamer RD, Nagy BV, Barboni MT, Gualtieri M, Boggio PS & Ventura DF (2015). Transcranial direct current stimulation can selectively affect different processing channels in human visual cortex. *Exp Brain Res.* 233(4):1213-23. doi: 10.1007/s00221-015-4199-7. Epub 2015 Jan 20. [PDF](#).
- Hamer RD (2016). The visual world of infants. *American Scientist* 104: 96-101.

SCIENTIFIC ABSTRACTS, PROFESSIONAL PRESENTATIONS:

- Hamer, R.D. and Tyler, C.W. (1987) The linear impulse response of cone pathways: variations with retinal locus. *Invest. Ophthalmol. Vis. Sci. Suppl.* 28, 232.
- Tyler, C.W. and Hamer, R.D. (1988) Linearity of human photoreception. *Invest. Ophthalmol. Vis. Sci. Suppl.* 29, 409.
- Tyler, C.W., Hamer, R.D. and Liu, L. (1990). Peripheral cone processing from single quanta to megaquantal flux levels. *Invest. Ophthalmol. Vis. Sci. Suppl.* 31, 493.
- Hamer, R.D., Tyler, C.W. and Liu, L. (1990). Threshold increment/decrement asymmetry reveals the site of saturation and gain control in the visual light response. Paper presented at the *13th European Conference on Visual Perception*, Sept. 4-7, Paris
- Hamer, R.D. and Tyler, C.W. (1991). Naka-Rushton saturation precedes inhibitory overshoot in primate cones: modeling cone flash responses. *Invest. Ophthalmol. Vis. Sci. Suppl.* 32, 906.
- Hamer, R.D. and Norcia, A.M. (1992) In spite of their high contrast sensitivity, infants are insensitive to oscillatory motion. *Perception Suppl.* 21, 2.
- Hamer, R.D. and Tyler, C.W. (1992) Isolation of R-cone response with red light. *Invest. Ophthalmol. Vis. Sci. Suppl.* 33, 704.
- Norcia, A.M., McNeer, K., Tucker, M., Williams, S.M. and Hamer, R.D. (1992) Development of binocular motion processing following oculinum in infantile esotropia. *Invest. Ophthalmol. Vis. Sci. Suppl.* 33, 870.
- Hamer, R.D. and Norcia, A.M. (1993) Infants are insensitive to the oscillatory motion of highly suprathreshold gratings. *Invest. Ophthalmol. Vis. Sci. Suppl.* 34, 977.
- Brown, R.J., Norcia, A.M., Hamer, R.D., Wilson, J.R. and Boothe, R.G. (1993) Development of motion processing mechanisms in monkey and human infants. *Invest. Ophthalmol. Vis. Sci. Suppl.* 34, 1356.
- Hamer, R.D. and Tyler, C.W. (1994) Biochemical simulations of primate cone phototransduction: differences from rods. *Invest. Ophthalmol. Vis. Sci. Suppl.* 35, 2122.
- Hamer, R.D. and Norcia, A.M. (1994) Critical review of techniques and practical applications of photoscreening. Paper presented at the *9th International Conf. on Infant Studies*, June 2-5, Paris.
- Hamer, R.D. and Norcia, A.M. (1995) A temporal nonlinearity in the developmental motion asymmetry. *Invest. Ophthalmol. Vis. Sci. Suppl.* 36, 689.

- Tyler, C.W. and Hamer, R.D. (1995) Photokinetic analysis of primate cone responses implies qualitative differences from rod transduction. *Vision Science and Its Applications, Tech. Digest Series, Opt. Soc. Am. 1*, 260-263.
- Hamer, R.D. and Tyler, C.W. (1995) A full-range linear model of the activation stages of vertebrate phototransduction. *Society for Neuroscience Annual Meeting*, p. 510.
- Hamer, R.D. and Tyler, C.W. (1996) Does the saturation period of vertebrate photocurrent flash response reflect *only* rhodopsin lifetime? *Invest. Ophthalmol. Vis. Sci.* 37, S811.
- Hamer, R.D. and Tyler, C.W. (1996) Implications of rod photocurrent recovery kinetics, from salamander to human. *Optical Society of America Annual Meeting, Optics & Photonics News (Suppl.)* 7, 121.
- Hamer, R.D. and Norcia, A.M. (1997) Relationship between the developmental motion asymmetry (DMA) and acuity development. *Invest. Ophthalmol. Vis. Sci.* 38, S499.
- Skoczinski, A.M., Norcia, A.M. and Hamer, R.D. (1997) A developmental study of visual noise masking and VEP contrast sensitivity. *Invest. Ophthalmol. Vis. Sci.* 38, S499.
- Hamer, R.D. (1998). Computational modeling of the full flash response dynamics of dark-adapted tiger salamander rod. *Investigative Ophthalmology & Visual Science*, 39:S955.
- Hamer, R.D. Computational modeling of voltage-clamped tiger salamander rod flash responses. Presented at Retinal Adaptation Workshop, Smith-Kettlewell Eye Research Institute, San Francisco, CA Jan 4- Jan 7, 1998.
- Hamer, R.D. (1999). How *signature* features in dark- and light-adapted photocurrent responses constrain models of vertebrate phototransduction. *Investigative Ophthalmology & Visual Science*, 40:S208.
- Hamer, R.D. (1999). Modeling both dark- & light-adapted vertebrate rod responses. Presented at the annual FASEB Summer Research Conference, Copper Mtn, CO, June 13-18.
- Hamer, R.D. & Norcia, A.M. (1999). Development of motion & pattern sensitive cortical mechanisms. Presented at the annual meeting of American Academy of Optometry, Dec. 9 - 13, Seattle WA.
- Hamer, R.D. (2000). Quantitative evaluation of Ca⁺⁺-feedback early in the phototransduction cascade: severe constraints are imposed if R^{*}-inactivation is rate-limiting. *Investigative Ophthalmology & Visual Science*, 41: S321.
- Hamer, R.D. (2001). Reading the T_{sat} leaves: vicissitudes of deducing phototransduction mechanisms from the shape of the T_{sat} vs log(I) function. *Investigative Ophthalmology & Visual Science*, 42: S183.
- Hamer, R.D. (2001). Reading the T_{sat} leaves: vicissitudes of deducing phototransduction mechanisms from the shape of the T_{sat} vs log(I) function. Presented at the Satellite Meeting of the 34th International Congress of Physiological Sciences, *Phototransduction: Molecular mechanisms of activation, termination and regulation of the light response*, Dunk Island, Australia, August 22 – 24, 2001.
- Hamer, R.D., Nicholas, S.C., Tranchina, D. & Liebman, P.A. (2002). A full stochastic molecular model of phototransduction: testing theories for the reproducibility of the vertebrate rod single photon response. Presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Fort Lauderdale, FL, May 4 – 10.
- 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 (<http://www.journalofvision.org/content/2/10/113>)
- Hamer, R.D., Nicholas, S.C. & Tranchina, D. (2003). Reproducibility of the single-photon response (SPR) of retinal rods: rigorous tests and predictions of a multiple phosphorylation (MPn) model. Presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Fort Lauderdale, FL, April 27 – May 2.
- 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 unraveled. Presented at the Annual Meeting of the European Conference on Visual Perception, Paris, France, Sept. 1 – 4.
- Hamer, R.D., Nicholas, S.C., Tranchina, D., Jarvinen, J.L.P. & Lamb, T.D. (2004). Towards a unified model of vertebrate rod phototransduction, from single-photon to highly saturating responses.

- Presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Fort Lauderdale, FL. April 25 – 29.
- Hamer, R.D., Nicholas, S.C., Tranchina, D. & Navid, A. (2005). On rhodopsin phosphorylation, arrestin-binding and the genesis of rod single-photon response reproducibility. Presented at the Biology & Chemistry of Vision, FASEB Summer Research Conference, Tucson, AZ, June 18-23.
- Hamer, R.D., Nicholas, S.C., Tranchina, D. & Navid, A. (2006) The role of arrestin binding in rod single-photon reproducibility and light-adapted gain control. Presented at the 10th Annual Vision Research Conference: Rhodopsin and Perspectives, Ft. Lauderdale, FL. April 28-29.
- Nicholas SC & Hamer, RD (2006) Changes in the period of photocurrent saturation can provide erroneous estimates of true underlying changes in early phototransduction gain: a theoretical analysis. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL. April 30-May 4.
- Navid A, Hamer RD (2006) A potential role for all-trans retinal in regulation of metarhodopsin decay in human rods. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL. April 25-29.
- Hamer, RD, Nicholas, SC & D. Tranchina, D & Navid, A. (2006) New complexities in vertebrate rod phototransduction revealed by computational modeling. **Invited presentation** at the Annual Meeting of the International Congress on Eye Research, Buenos Aires, Argentina. Oct. 29 – Nov. 4.
- Hamer, RD (2007). Physiological mechanisms underlying the tactile sense: sometimes every spike counts! **Invited presentation** at the Annual Meeting of the Sociedade Brasileira Para o Progresso da Ciência (SbNEC; Brazilian Society for Progress in Science), Belém, Pará, Brazil. July 8 – July 13.
- Hamer, RD, Tranchina, D, Nicholas, SC & Lamb, TD (2007). New Knockout and Overexpression Data Challenge Our Understanding of the 'Front-End' Reactions in Vertebrate Rod Phototransduction. Presented at the Annual Meeting of the International Color Vision Society, Belem, Pará, Brazil. July 27 – July 31.
- Gualtieri, M, Bandeira, M, Hamer, RD, Rodrigues, AR, Costa, MF, Oliveira, AGF, Sadun, F, de Negri, AM, Berezovsky, A, Salomão, SR, Carelli, V, Sadun, AA, & Ventura, DF. (2007). Psychophysical assessment of magnocellular and parvocellular responses in unaffected carriers of 11778 LHON using a luminance contrast sensitivity procedure. Presented at the Annual Meeting of the International Color Vision Society (ICVS), Belem, Pará, Brazil. July 27 – July 31.
- Oliveira, AGF, Costa, MF, Hamer, RD & Ventura, DF. (2007). Evaluation of sweep VEP acuity and contrast sensitivity in healthy premature and term infants. Presented at the Annual Meeting of the International Color Vision Society (ICVS), Belem, Pará, Brazil. July 27 – July 31.
- Gualtieri, M, Bandeira, M, Damico, FM, Moura, ALA, Hamer, RD & Ventura, DF. (2008). Magnocellular and parvocellular contrast sensitivity in type 2 diabetics with normal fundus and non-proliferative retinopathy. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, April 27 – May 2.
- Moura, ALA, Gualtieri, M, Teixeira, RAA, Bandeira, ML, Callegaro, D, Hamer, RD & Ventura, DF. (2008). Magno and parvocellular pathway responses in patients with multiple sclerosis. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, April 27 – May 2.
- França, VCRM, Hamer, RD, Ventura, DF, Oiwa, NN, Ibidi, SM, Diniz, EMA, Origo, GG & Costa, MF. (2008) Mensuração da acuidade visual de crianças recém-nascidas com desnutrição intra-uterina pelos cartões de acuidade de Teller. XXIII Reunião Anual da *FeSBE*, Federação de Sociedades de Biologia Experimental (Federation of the Experimental Biology Society), 20 a 23 de Agosto. Águas de Lindóia, São Paulo, Brasil. (<http://www.fesbe.org.br/fesbe2008/>)
- França, VCRM, Hamer, RD, Ventura, DF, Oiwa, NN, Ibidi, SM, Diniz, EMA, Origo, GG & Costa, MF. (2008) Avaliação da acuidade visual em crianças recém-nascidas com desnutrição intra-uterina medida pelo potencial visual evocado de varredura.. XXIII Reunião Anual da *FeSBE*, Federação de Sociedades de Biologia Experimental (Federation of the Experimental Biology Society), 20 a 23 de Agosto. Águas de Lindóia, São Paulo, Brasil. (<http://www.fesbe.org.br/fesbe2008/>)
- França, VCRM, Hamer, RD, Ventura, DF, Oiwa, NN, Diniz, EMA, Nishimura, S & Costa, MF. (2008) Acuidade visual de crianças recém-nascidas com desnutrição intra-uterina medida pelo potencial visual evocado de varredura para frequências temporais diferentes. *I NEUROLATAM*, I Congresso

- Ibro/Larc de Neurociências da América Latina, Caribe e Península Ibérica, 1 a 4 de Setembro, Búzios, Rio de Janeiro, Brasil.
- Hamer, RD, França, VCRM, Costa, MF, & Ventura, DF. (2009). Evaluation of effect of fetal growth restriction (FGR) on visual acuity development in fullterm Brazilian newborns: preliminary results using Preferential-Looking (PL) and Sweep VEP (sVEP). Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, May 3 – May 7.
- França, VCRM, Hamer, RD, Ventura, DF, Oiwa, NN, Diniz, EMA., Ibidi, SM, Nishimura, SMMR & Costa, MF (2009). Alterações no registro do potencial visual evocado de varredura de recém-nascidos pequenos para a idade gestacional. XXIV Reunião Anual da FeSBE, Federação de Sociedades de Biologia Experimental (Federation of the Experimental Biology Society), Águas de Lindóia, SP, Brasil, 19 – 22 Agosto.
- Ioshimoto, GL, Hamer, RD, Aguiar, RG & Ventura, DF. (2009). Eletrorretinograma de camundongos modelos de Alzheimer (2xTg DA). XXIV Reunião Anual da FeSBE, Federação de Sociedades de Biologia Experimental (Federation of the Experimental Biology Society), Águas de Lindóia, SP, Brasil, 19 – 22 Agosto.
- (<http://www.sbnec.org.br/site/neurolatam/>)
- Hamer, RD, Carvalho, FA & Ventura, DF. (2010). Contrast dependence of vernier (VRN) displacement thresholds assessed by steady-state Sweep VEP supports the hypothesis that magnocellular input to cortex underlies VRN performance. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, May 1 – May 5.
- Gualieri, M, Damico, FM, Moura, AL, Hamer, R & Ventura, DF. (2010). Fast adaptive mechanisms in the diabetic retina assessed from Mferg recordings. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, May 1 – May 5.
- Hamer, R.D., Carvalho, F.A., Camargo, M.V.Z.A., Ventura, D. F. (2010) Human cortical vernier and motion responses assessed by steady-state Sweep-VEP: relation to magno- and parvocellular processing streams. **Invited presentation** at XXV Reunião Anual da Federação de Sociedades de Biologia Experimental (FeSBE; Federation of the Experimental Biology Society), 25 a 28 de agosto de 2010, Águas de Lindóia, São Paulo, Brasil.
- Hamer, RD. (2010). Evoked potential measurement of human vernier hyperacuity and potential relation to magno- and parvocellular parallel processing streams. **Invited presentation** at the *International Symposium on Vision and Visual Dysfunction*, Belém, Pará, Brasil, 18 – 25 September.
- Hamer, RD, Carvalho, FA, & Ventura, DF. (2011). The effect of gap and contrast on sweep vep responses to periodic vernier offsets. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, May 1 – May 5.
- Camargo, MVZA, Hamer, RD, & Ventura, DF. (2011). Spatiotemporal properties of human cortical vernier responses measured with the sweep visual evoked potential (sVEP). Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, May 1 – May 5.
- França, VCRM, Hamer, RD, Ventura, DF & Costa, MF. (2011). Sweep VEP (sVEP) Evaluation the effect of fetal growth restriction (*fgr*) on early contrast sensitivity development in fullterm brazilian newborns. Presented at Annual Meeting of ARVO, Ft. Lauderdale, FL, May 1 – May 5.
- Hamer, RD (2011). Development of motion processing and binocularity: insights from evoked potential measurements. **Invited presentation** at the XXVI Annual Meeting of Federação de Sociedade de Biologia Experimental (FeSBE; Federation of the Experimental Biology Society), Rio de Janeiro, Brasil, August 24 – August 27.
- Hamer, RD, Souza, GS, Costa, TL, Gomes, BD, Silveira, LCL & Ventura, DF. (2012). Mapping the spatiotemporal (S-T) domain and gain of putative M- and P-dominated limbs of the human cortical contrast response function (**CRF**) using the Sweep VEP (sVEP). Presented at the Annual Meeting of ARVO, Ft. Lauderdale, FL, May 6 – May 10.
- Hamer, RD, Souza, GS, Costa, TL, Gomes, BD, Silveira, LCL & Ventura, DF. (2012). Spatiotemporal domain and gain of mechanisms underlying the human cortical contrast response function (CRF) using the Sweep VEP (sVEP). **Invited presentation** at the International Society for Clinical Electrophysiology of Vision (ISCEV), Ft. Lauderdale, FL, May 5, 2012.
- Gualtieri, M, Hamer, RD, Bandeira, ML, Bonci, DM, Salomao, SR, Berezovsky, A, Carelli, V, Sadun, AA & Ventura, DF. (2012). Contrast sensitivity, but not contrast gain, is affected in asymptomatic

- carriers of 11778 Leber's Hereditary Optic Neuropathy (LHON) as assessed with the pedestal- Δ -pedestal protocol. Presented at the Annual Meeting of ARVO, Ft. Lauderdale, FL, May 6 – May 10.
- França, Valtenice de Cássia Rodrigues de Matos , Hamer, R. D. , Costa, M. F. , Ventura, D. F. , IBIDI, S. M. , Diniz, E. M. A . Evaluación de la agudeza visual y la sensibilidad al contraste en recién nacidos pequeños para la edad gestacional. Presented at the 88 Congreso de la Sociedad Española de Oftalmología, Barcelona, Spain, September 26 - 29, 2012.
- França, Valtenice de Cássia Rodrigues de Matos , Hamer, R. D. , Costa, M.F. Avaliação da acuidade visual e sensibilidade ao contraste em recém-nascidos pequenos para a idade gestacional. Presented at VI Congresso Interno do Instituto de Psicologia, University of São Paulo, São Paulo, SP, Brasil, October 29-30, 2012.
- Hamer, RD, Souza, GS, Costa TL, Gomes, BD, Silveira, LCL & Ventura, DF. (2012). Towards development of a spatiotemporal map of the magnocellular and parvocellular contribution to the human cortical contrast response function using the Sweep VEP. **Invited presentation** at the XXVII Annual Meeting of Federação de Sociedade de Biologia Experimental (FeSBE; Federation of the Experimental Biology Society), Águas de Lindóia, São Paulo, Brasil, August 22 – August 25.
- Hamer, RD, Souza, GS, Costa TL, Gomes, BD, Silveira, LCL & Ventura, DF. (2013). Principal components analysis (PCA) of human cortical contrast response functions reveals two dominant mechanisms: M and P? Presented at the Annual Meeting of ARVO, Seattle, WA, May 5 – May 9.
- Hamer, RD (2013). Multiple contrast processing mechanisms underlying the steady-state sweep VEP contrast response function (CRF) are separable. **Invited presentation** at the Department of Psychology, University of Washington, Seattle, WA, USA. May 3.
- Hamer, RD (2013). Development of color vision (Desenvolvimento de Visão Cromática). **Invited presentation** at the Congresso Brasileiro de Neurovisão (Brazilian Neurovision Conference), Belo Horizonte, Minas Gerais, Brasil, July 17 – July 20.
- Hamer, RD (2013). Complex aspects of visual-perceptual development (Aspectos complexos presentes durante desenvolvimento visual-perceptual). **Invited presentation** at the Congresso Brasileiro de Neurovisão (Brazilian Neurovision Conference), Belo Horizonte, Minas Gerais, Brasil, July 17 – July 20.
- Hamer, RD (2013). From the subjective to the objective – the importance of psychophysics. **Invited presentation** at the XXVIII Annual Meeting of Federação de Sociedade de Biologia Experimental (FeSBE; Federation of the Experimental Biology Society), Caxambú, Minas Gerais, Brasil, August 21 – August 24.
- Costa, T.L.; Hamer,R.D.; Nagy, B.V.; Gualtieri, M.; Barboni, M.T.S.; Boggio, P.S.; Ventura, D.F. (2013). Transcranial direct current stimulation (tDCS) modulates Vernier, contrast responses and differentially affects visual pathways involved in achromatic vision. Neuropsychology workshop: From theoretical work, to practical applications, and back again: a neuropsychologist's tale, University of Leuven, Leuven, Belgium.
- Costa, T.L.; Hamer,R.D.; Nagy, B.V.; Gualtieri, M.; Barboni, M.T.S.; Boggio, P.S.; Ventura, D.F. (2013). Estimulação transcraniana por corrente contínua (ETCC) modula respostas a mudanças de contraste, estímulos Vernier e afeta distintamente vias visuais envolvidas na visão acromática. V Simpósio Internacional de Neuromodulação, Universidade Presbiteriana Mackenzie, São Paulo, Brasil.
- Hamer, R.D. (2014). Human cortical responses to periodic breaks in collinearity. Invited colloquium at the Department of Psychology, Rutgers University, Piscataway, NJ, April 21.
- Hamer, R.D. (2014). Human cortical responses to periodic vernier offsets: effects of contrast and gap. Meeting of the International Society for Clinical Electrophysiology of Vision, ISCEV@ARVO, Orlando, FL, May 3, 2014.
- Costa TL, Hamer RD, Nagy BV, Barboni MTS, Katayama RK, Gualtieri M, Boggio PS, Ventura DF. (2014). Efeitos da estimulação transcraniana por corrente contínua sobre diferentes vias do sistema visual. Presentation at the XXIX Annual Meeting of Federação de Sociedade de Biologia Experimental (FeSBE; Federation of the Experimental Biology Society), Caxambú, Minas Gerais, Brasil, August 27 – August 30.
- Hamer, RD, Souza, GS, Costa,TL, Peterzell, DH, Milioni, ALV, Gomes, BD, Silveira, LCL, & Ventura, DF (2016). Analysis of individual and spatiotemporal variability in human cortical contrast response

functions: further evaluation of separable high and low contrast processes. *Journal of Vision* September (16), 878. doi:10.1167/16.12.878.

França, Valtenice de Cássia Rodrigues de Matos; Hamer, RD, Ventura, DF, Waiswol, M, Rodrigues,APS, Costa, MF. (2016). Visual acuity and cognitive development in children after bilateral congenital cataracts surgery. In: 2nd FALAN Congress, Buenos Aires.

França, Valtenice de Cássia Rodrigues de Matos; Hamer, RD, Ventura, DF, Waiswol, M, Rodrigues,APS, Costa, MF. (2016). Comparação entre acuidade visual e acuidade de Vernier de crianças saudáveis. In: XXXI Reunião Anual da FeSBE, Foz do Iguaçu, Paraná.