




Dr. Gerald R. Popelka, PhD

Consulting Professor of Otolaryngology

Rad/Radiological Sciences Laboratory

 NIH Biosketch available Online

 Curriculum Vitae available Online

 Resume available Online

Bio

BIO

Gerald R. Popelka obtained a neuroscience PhD degree from the University of Wisconsin followed by a two year post doctoral research fellowship in Otolaryngology at UCLA. Prior to this he earned a masters degree in Audiology from Kent State University. He was a full professor at Washington University in St. Louis when in 2004 he came to Stanford as a faculty member in Otolaryngology and as Chief of Audiology. As PI for his research lab in Otolaryngology he initiated and completed successful collaborative research projects among diverse academic divisions including Otolaryngology, Neurology, Neurosurgery, Radiology, Electrical Engineering and Mechanical Engineering. Popelka's research covers both animal and human studies and has been funded continuously with grants from NIH and a wide variety of other agencies and philanthropic gifts.

Popelka is a co-inventor of the world's first all digital hearing aid. The resulting patent forms the basis for virtually all hearing aids currently produced worldwide. In 2000, he conceived and lead the development of JARO, the peer-reviewed Journal of the Association for Research in Otolaryngology, now recognized as the premier, high impact international auditory scientific research journal.

With over 135 publications, including peer-reviewed research articles, review articles, two college textbooks and a book on hearing aid research, along with many research presentations and various achievement awards, he has an international reputation for creating and using leading-edge technology that addresses both basic science issues and clinical applications. He remains in the forefront of creating and developing innovative biomedical approaches focussed on several basic neuroscience issues. Currently his research is conducted in Radiology and is centered on understanding, creating and developing effective radiologic imaging related to non-invasive neuromodulation intervention using acoustic and transcranial focussed ultrasound signals for several chronic neurologic conditions including auditory disorders.

Popelka currently teaches in Radiology and Anatomy and has taught previously in Otolaryngology, Electrical Engineering, Computer Science and Genetics. His other Stanford responsibilities include faculty affiliation with several multidisciplinary centers, institutes and initiatives. He also regularly supervises doctoral student dissertations in a variety of departments including Electrical Engineering, Biomedical Engineering and Music.

CURRENT ROLE AT STANFORD

Faculty Member, Stanford Center on Longevity, Advisory Council

Faculty Affiliate, Stanford Bio-X

Faculty Affiliate, Stanford Center for Population Health Sciences

Faculty Affiliate, Stanford Wu Tsai Neurosciences Institute

Faculty Member, Stanford Balance Center (Co-Founder)

Faculty Member, Stanford Wearable Electronics Initiative, eWEAR

Faculty Member, Stanford Center for Artificial Intelligence in Medicine & Imaging, AIMI

Faculty Member, Stanford PhD Dissertation Committees (5 total, 2 current)

Faculty Member, Stanford Undergraduate Advising (37 total, 2 current)

HONORS AND AWARDS

- Certificate of Appreciation for Founding JARO, Association for Research in Otolaryngology (2007)
- Fellow, American Academy of Audiology (2004)
- Special Citation, Association for Research in Otolaryngology (2000)
- Silver Certificate, Acoustical Society of America (1997)
- Knud Terkildsen Research Fellowship, University of Copenhagen (1992)
- Fellow, American Speech-Language-Hearing Association (1987)

EDUCATION AND CERTIFICATIONS

- PostDoc, UCLA , Otolaryngology (1978)
- PhD, University of Wisconsin , Communication Sciences (Neuroscience emphasis) (1974)
- MA, Kent State University , Audiology (1970)
- BA, Kent State University , Experimental Psychology (1968)

SERVICE, VOLUNTEER, AND COMMUNITY WORK

- Board Member (9/1/2009 - 9/1/2019)

PATENTS

- Gerald R Popelka. "United States Six patents in process", Stanford University
- Gerald R Popelka, Peter A Tass. "United States Patent 10,933,213 Device and Method for Hearing threshold Adapted Acoustic Stimulation", Stanford University, Feb 20, 2021
- A Maynard Engebretson, Robert Morley, Gerald Popelka. "United States Patent 4,548,082 Hearing aids, signal supplying apparatus, systems for compensating hearing deficiencies, and methods", Washington University, Oct 22, 1985

PERSONAL INTERESTS

I have an interest in optimizing scientific oral and poster presentations and writing, especially peer-reviewed research articles. I believe the proliferation of newer open access research journals, both legitimate and illegitimate, is detrimental to the scientific method largely because the long term viability of the entities that operate these is unknown and the peer-review process has little oversight. One model I proposed is that scientific societies become the holder of the copyright and the monitor of the quality of the peer-review process. Under this model I conceived of and developed JARO, the peer-reviewed journal of the Association for Research in Otolaryngology that launched in 2000 and has since become the highest impact scientific journal in auditory neuroscience. Because of this history, I am interested in helping other societies consider this model.

I also have a decades long interest in environmental issues ranging from toxic exposures to the auditory system from recreational sound, occupational sound and pharmaceuticals, to more general issues including climate change and global warming. I routinely participate in governmental regulatory processes, political activism and focussed volunteer efforts.

Professional

PROFESSIONAL INTERESTS

I have an interest in optimizing scientific oral and poster presentations and writing, especially peer-reviewed research articles. I believe the proliferation of newer open access research journals, both legitimate and illegitimate, is detrimental to the scientific method largely because the long term viability of the entities that operate these is unknown and the peer-review process has little oversight. One model I proposed is that scientific societies become the holder of the copyright and the monitor of the quality of the peer-review process. Under this model I conceived of and developed JARO, the peer-reviewed journal of the Association for Research in Otolaryngology that launched in 2000 and has since become the highest impact scientific journal in auditory neuroscience. Because of this history, I am interested in helping other societies consider this model.

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PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Fellow, American Academy of Audiology (2004 - present)
- Member, American Auditory Society (1999 - present)
- Member, Association for Research in Otolaryngology (1978 - present)
- Member, Acoustical Society of America (1968 - present)
- Member, American Speech-Language-Hearing Association (1968 - present)

Publications

PUBLICATIONS

- **A deep-learning model for one-shot transcranial ultrasound simulation and phase aberration correction** *Medical Physics*
Naftchi-Ardebili, K., Singh, K., Popelka, G., Butts Pauly, K.
2026; 53 (1)
- **Focal Volume, Acoustic Radiation Force, and Strain in Two-Transducer Regimes** *IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL*
Naftchi-Ardebili, K., Menz, M. D., Salahshoor, H., Popelka, G. R., Baccus, S. A., Pauly, K.
2024; 71 (10): 1199-1216
- **Use of Ultra-Short Echo Time MRI to Improve Temporal Bone Imaging.** *The Laryngoscope*
Kaufman, A. C., Fu, F., Martinez, M. C., Fischbein, N., Popelka, G. R., Butts Pauly, K., Blevins, N. H.
2024
- **Development and validation of a computational method to predict unintended auditory brainstem response during transcranial ultrasound neuromodulation in mice.** *Brain stimulation*
Choi, M. H., Li, N., Popelka, G., Butts Pauly, K.
2023
- **Transcranial ultrasound stimulation: considerations for pulse shaping** *Brain Stimulation*
Butts Pauly, K., Kop, B., Qui, Z., Singh, K., Choi, M., Verhagen, L., Popelka, G.
2023; 16 (1): 200-201
- **A Brief History of JARO-An Origin Story!** *Journal of the Association for Research in Otolaryngology : JARO*
Popelka, G. R., Popper, A. N.
2022

- **Transcranial ultrasound neuromodulation of the thalamic visual pathway in a large animal model and the dose#response relationship with MR#ARFI** *Scientific Reports*
Mohammadjavadi, M., Ash, R. T., Li, N., Gaur, P., Kubanek, J., Saenz, Y., Glover, G. H., Popelka, G. R., Norcia, A. M., Butts Pauly, K.
2022; 12: 19588
- **Elimination of peripheral auditory pathway activation does not affect motor responses from ultrasound neuromodulation.** *Brain stimulation*
Mohammadjavadi, M., Ye, P. P., Xia, A., Brown, J., Popelka, G., Pauly, K. B.
2019
- **Acoustic coordinated reset therapy for tinnitus with perceptually relevant frequency spacing and levels** *Scientific Reports*
Tass, P. A., Silchenko, A. N., Popelka, G. R.
2019; 9: 13607
- **Anatomic measures of upper airway structures in obstructive sleep apnea.** *World journal of otorhinolaryngology - head and neck surgery*
Barrera, J. E., Pau, C. Y., Forest, V. I., Holbrook, A. B., Popelka, G. R.
2017; 3 (2): 85-91
- **Validation of a Mobile Device for Acoustic Coordinated Reset Neuromodulation Tinnitus Therapy** *JOURNAL OF THE AMERICAN ACADEMY OF AUDIOLOGY*
Hauptmann, C., Wegener, A., Poppe, H., Williams, M., Popelka, G., Tass, P. A.
2016; 27 (9): 720-731
- **Distribution Characteristics of Air-Bone Gaps: Evidence of Bias in Manual Audiometry.** *Ear and hearing*
Margolis, R. H., Wilson, R. H., Popelka, G. R., Eikelboom, R. H., Swanepoel, D. W., Saly, G. L.
2016; 37 (2): 177-188
- **Hearing Aids**
Popelka, G. R., Moore, B. C., Fay, R. R., Popper, A. N.
Springer Science.2016
- **Distribution characteristics of normal pure-tone thresholds.** *International journal of audiology*
Margolis, R. H., Wilson, R. H., Popelka, G. R., Eikelboom, R. H., Swanepoel, D. W., Saly, G. L.
2015; 54 (11): 796-805
- **Vestibular Schwannoma** *Adult Audiology Casebook, M Valente and LM Valente, Eds.*
Popelka, G. R.
Thieme Medical.2015: 44–50
- **Comprehensive Measures of Sound Exposures in Cinemas Using Smart Phones** *EAR AND HEARING*
Huth, M. E., Popelka, G. R., Blevins, N. H.
2014; 35 (6): 680-686
- **Bone-Conduction Calibration** *Semin Hear*
Margolis, R., Popelka, G.
2014; 35 (4): 329-345
- **Preliminary comparison of bone-anchored hearing instruments and a dental device as treatments for unilateral hearing loss** *INTERNATIONAL JOURNAL OF AUDIOLOGY*
Moore, B. C., Popelka, G. R.
2013; 52 (10): 678-686
- **Diagnostic measurements and imaging technologies for the middle ear** *The Middle Ear, Science, Otosurgery and Technology, S Puria, RR Fay and AN Popper, Eds., Springer, NY, NY*
Popelka, G., Hunter, LL
2013; Chapter 8
- **A New Standardized Format for Reporting Hearing Outcome in Clinical Trials** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Gurgel, R. K., Jackler, R. K., Dobie, R. A., Popelka, G. R.
2012; 147 (5): 803-807

- **Is It Valid to Calculate the 3-Kilohertz Threshold by Averaging 2 and 4 Kilohertz?** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Gurgel, R. K., Popelka, G. R., Oghalai, J. S., Blevins, N. H., Chang, K. W., Jackler, R. K.
2012; 147 (1): 102-104
- **The effect of continuous positive airway pressure on middle ear pressure** *LARYNGOSCOPE*
Lin, F. Y., Gurgel, R. K., Popelka, G. R., Capasso, R.
2012; 122 (3): 688-690
- **Most, SP, Corey CL, Popelka, GR, Barrera JE: An Analysis of Malar Fat Volume in Two Age Groups: Implications for Craniofacial Surgery** *Craniofacial Trauma & Reconstruction*
Most, S., Most, SP, Corey CL, Popelka, GR, Barrera JE
2012; 5 (4): 231
- **Long-Term Safety and Benefit of a New Intraoral Device for Single-Sided Deafness** *OTOLOGY & NEUROTOLOGY*
Murray, M., Miller, R., Hujoel, P., Popelka, G. R.
2011; 32 (8): 1262-1269
- **Auditory Impairment in Infants at Risk for Bilirubin-Induced Neurologic Dysfunction** *SEMINARS IN PERINATOLOGY*
Shapiro, S. M., Popelka, G. R.
2011; 35 (3): 162-170
- **Efficacy and Safety of an In-the-Mouth Bone Conduction Device for Single-Sided Deafness** *OTOLOGY & NEUROTOLOGY*
Murray, M., Popelka, G. R., Miller, R.
2011; 32 (3): 437-443
- **Safety of an Intra-Oral Hearing Device Utilizing a Split-Mouth Research Design** *Journal of Clinical Dentistry*
Miller, R., Hujoel P, Murray, M, Popelka, GR
2011; 22 (5): 159-62
- **Stimulus Frequency Otoacoustic Emissions in Wild-Type and TECTA Mice** *11th International Workshop on the Mechanics of Hearing*
Pikhart, K. N., Popelka, G. R., Moleti, A., Sisto, R., Oghalai, J. S., Xia, A., Puria, S.
AMER INST PHYSICS.2011
- **Middle-ear function at high frequencies quantified with advanced bone-conduction measures** *5th International Symposium on Middle Ear Mechanics in Research and Otology (MEMRO 2009)*
Popelka, G. R., Telukuntla, G., Puria, S.
ELSEVIER SCIENCE BV.2010: 85-92
- **Reliability of airway obstruction analyses from Sleep MRI sequences** *113th Annual Meeting of the American-Academy-of-Otolaryngology-Head-and-Neck-Surgery-Foundation-and-OTO-EXPO*
Barrera, J. E., Chang, R. C., Popelka, G. R., Holbrook, A. B.
SAGE PUBLICATIONS LTD.2010: 526-30
- **Preliminary Evaluation of a Novel Bone-Conduction Device for Single-Sided Deafness** *OTOLOGY & NEUROTOLOGY*
Popelka, G. R., Derebery, J., Blevins, N. H., Murray, M., Moore, B. C., Sweetow, R. W., Wu, B., Katsis, M.
2010; 31 (3): 492-497
- **Sleep MRI Novel technique to identify airway obstruction in obstructive sleep apnea** *OTOLARYNGOLOGY-HEAD AND NECK SURGERY*
Barrera, J. E., Holbrook, A. B., Santos, J., Popelka, G. R.
2009; 140 (3): 423-425
- **Single breath CO measurements normalized to 5% CO2 in Coombs' test positive neonates** *PHYSIOLOGICAL MEASUREMENT*
Engel, R. R., Popelka, G.
2007; 28 (9): 977-988
- **Hearing Impairment** *Encyclopedia of Science and Technology, McGraw Hill*
Popelka, G.
2007
- **Novel Quantification of Airway Obstruction in Adult Sleep Apnea** *CHEST*

- Barrera, J., Holbrook, AB, Santos, JM, Popelka, GR
2007; 132: 464
- **In vivo imaging of mammalian cochlear blood flow using fluorescence microendoscopy** *Annual Meeting of the American-Neurotology-Society*
Monfared, A., Blevins, N. H., Cheung, E. L., Jung, J. C., Popelka, G., Schnitzer, M. J.
LIPPINCOTT WILLIAMS & WILKINS.2006: 144–52
 - **Dynamics of Speech and Swallowing** *Association for Research in Otolaryngology Abstracts*
Popelka, G., Kent, RD
2006; 2006: 305
 - **Auditory Function and Hyperbilirubinemia in the Developing Neonate** *Association for Research in Otolaryngology Abstracts*
Popelka, G., Martinosky, JW, Walden, RE, Gourley, GR
2005; 2005: 334
 - **Newborn hearing screening with combined otoacoustic emissions and auditory brainstem responses.** *Journal of the American Academy of Audiology*
Hall, J. W., Smith, S. D., Popelka, G. R.
2004; 15 (6): 414-425
 - **Identification of noise sources that influence distortion product otoacoustic emission measurements in human neonates** *EAR AND HEARING*
Popelka, G. R., Karzon, R. K., Clary, R. A.
1998; 19 (4): 319-328
 - **GROWTH OF THE 2F(1)-F(2) DISTORTION-PRODUCT OTOACOUSTIC EMISSION FOR LOW-LEVEL STIMULI IN HUMAN NEONATES** *EAR AND HEARING*
Popelka, G. R., Karzon, R. K., Arjmand, E. M.
1995; 16 (2): 159-165
 - **GROWTH OF DISTORTION-PRODUCT OTOACOUSTIC EMISSIONS WITH PRIMARY-TONE LEVEL IN HUMANS** *HEARING RESEARCH*
Popelka, G. R., Osterhammel, P. A., Nielsen, L. H., Rasmussen, A. N.
1993; 71 (1-2): 12-22
 - **CLINICAL-SIGNIFICANCE OF PROBE-TONE FREQUENCY RATIO ON DISTORTION-PRODUCT OTOACOUSTIC EMISSIONS** *SCANDINAVIAN AUDIOLOGY*
Nielsen, L. H., Popelka, G. R., Rasmussen, A. N., Osterhammel, P. A.
1993; 22 (3): 159-164
 - **CLINICAL-SIGNIFICANCE OF RELATIVE PROBE-TONE LEVELS ON DISTORTION-PRODUCT OTOACOUSTIC EMISSIONS** *SCANDINAVIAN AUDIOLOGY*
Rasmussen, A. N., Popelka, G. R., Osterhammel, P. A., Nielsen, L. H.
1993; 22 (4): 223-229
 - **NEURAL PRESBYCUSIS - A DIAGNOSTIC DILEMMA** *MEETING OF THE AMERICAN OTOLOGICAL SOC*
Gates, G. A., Popelka, G. R.
LIPPINCOTT-RAVEN PUBL.1992: 313–17
 - **HEARING-AID EVALUATION AND FITTING** *OTOLARYNGOLOGIC CLINICS OF NORTH AMERICA*
Popelka, G. R., Gates, G. A.
1991; 24 (2): 415-428
 - **HEARING LEVELS OF RAILROAD TRAINMEN** *LARYNGOSCOPE*
Clark, W. W., Popelka, G. R.
1989; 99 (11): 1151-1157
 - **Factors which affect measures of speech audibility with hearing aids.** *Ear and hearing*
Popelka, G. R., MASON, D. I.
1987; 8 (5): 109S-118S

- **Development of an ear-level digital hearing aid and computer-assisted fitting procedure: an interim report.** *Journal of rehabilitation research and development*
Engebretson, A. M., Morley, R. E., Popelka, G. R.
1987; 24 (4): 55-64
- **Computer-assisted hearing-aid evaluation and fitting program.** *Advances in oto-rhino-laryngology*
Popelka, G. R.
1987; 37: 166-168
- **New developments in hearing aid technology.** *Advances in oto-rhino-laryngology*
Popelka, G. R.
1987; 37: 162-165
- **AUDIOLOGICAL FINDINGS IN YOUNG-PATIENTS WITH HYPOPHOSPHATEMIC BONE-DISEASE** *ANNALS OF OTOLGY RHINOLOGY AND LARYNGOLOGY*
Meister, M., Johnson, A., Kim, G. S., Popelka, G. R., Whyte, M. P.
1986; 95 (4): 415-420
- **COMPARISON OF HEARING-AID GAIN USING FUNCTIONAL, COUPLER, AND PROBE-TUBE MEASUREMENTS** *JOURNAL OF SPEECH AND HEARING RESEARCH*
Mason, D., Popelka, G. R.
1986; 29 (2): 218-226
- **FREQUENCY-SELECTIVITY AND THRESHOLDS OF BRIEF STIMULI SUITABLE FOR ELECTRIC-RESPONSE AUDIOMETRY** *AUDIOLOGY*
Davis, H., HIRSH, S. K., Popelka, G. R., Formby, C.
1984; 23 (1): 59-74
- **ACOUSTIC IMMITTANCE MEASURES - TERMINOLOGY AND INSTRUMENTATION** *EAR AND HEARING*
Popelka, G. R.
1984; 5 (5): 262-267
- **AUDIOLOGIC FINDINGS IN A CHILD WITH A SINGLE-CHANNEL COCHLEAR IMPLANT** *JOURNAL OF SPEECH AND HEARING DISORDERS*
Popelka, G. R., GITTELMAN, D. A.
1984; 49 (3): 254-261
- **The significance of acoustic admittance procedures in the audiologic evaluation of multiply-handicapped children.** *British journal of audiology*
HIMELFARB, M. Z., Popelka, G. R., WEISER, A., SHANON, E.
1981; 15 (1): 21-24
- **TYMPANOMETRY IN NORMAL NEONATES** *JOURNAL OF SPEECH AND HEARING RESEARCH*
HIMELFARB, M. Z., Popelka, G. R., SHANON, E.
1979; 22 (1): 179-191
- **EFFECT OF SENSORINEURAL HEARING-LOSS ON ACOUSTIC STAPEDIUS REFLEX GROWTH FUNCTIONS** *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA*
Silman, S., Popelka, G. R., GELFAND, S. A.
1978; 64 (5): 1406-1411
- **EFFECTS OF EXPERIMENTALLY-PRODUCED MIDDLE-EAR LESIONS ON TYMPANOMETRY IN CATS** *ACTA OTO-LARYNGOLOGICA*
Margolis, R. H., Osguthorpe, J. D., Popelka, G. R.
1978; 86 (5-6): 428-436
- **COMMENTS ON ACOUSTIC-REFLEX RESPONSE FOR BONE-CONDUCTED SIGNALS** *ACTA OTO-LARYNGOLOGICA*
Popelka, G. R., Dubno, J. R.
1978; 86 (1-2): 64-70
- **INTERACTIONS AMONG TYMPANOMETRIC VARIABLES** *JOURNAL OF SPEECH AND HEARING RESEARCH*
Margolis, R. H., Popelka, G. R.
1977; 20 (3): 447-462

- **EFFECT OF ACTIVATING SIGNAL BANDWIDTH ON ACOUSTIC-REFLEX THRESHOLDS** *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA*
Popelka, G. R., Margolis, R. H., Wiley, T. L.
1976; 59 (1): 153-159
- **LOUDNESS AND ACOUSTIC REFLEX** *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA*
Margolis, R. H., Popelka, G. R.
1975; 58 (6): 1330-1332
- **STATIC AND DYNAMIC ACOUSTIC IMPEDANCE MEASUREMENTS IN INFANT EARS** *JOURNAL OF SPEECH AND HEARING RESEARCH*
Margolis, R. H., Popelka, G. R.
1975; 18 (3): 435-443
- **Letter: Acoustic reflex and critical bandwidth.** *journal of the Acoustical Society of America*
Popelka, G. R., KARLOVICH, R. S., Wiley, T. L.
1974; 55 (4): 883-885
- **GESTURES AND VISUAL SPEECH RECEPTION** *AMERICAN ANNALS OF THE DEAF*
Popelka, G. R., BERGER, K. W.
1971; 116 (4): 434-436