

Mark Hollins

Curriculum Vitae

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Contact Information

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Education

Florida State University, Tallahassee, Florida: B.A. (Psychology), 1966
Brown University, Providence, Rhode Island: M.Sc. (Psychology), 1969
Brown University, Providence, Rhode Island: Ph.D. (Psychology), 1971

Positions Held

NSF Postdoctoral Fellow, University of Michigan, Ann Arbor, 1970-1971
Research Fellow, Brown University, 1971-1973
Assistant Professor of Psychology, UNC-Chapel Hill, 1973-1978
Associate Professor of Psychology, UNC-Chapel Hill, 1979-1990
Professor of Psychology, UNC-Chapel Hill, 1990-present
Adjunct Professor of Endodontics, 1998-present

Award

Distinguished Teaching Award for Post-Baccalaureate Instruction (2007),
UNC-Chapel Hill

Professional Activities

Professional Affiliations

American Psychological Association (Fellow, Division 3); International Association for the Study of Pain; Psychonomic Society; Tactile Research Group

Advisory/Review Panels

Member, Editorial Advisory Board, *Encyclopedia of Perception* (Sage Publications, 2008)

Member, Peer Review Panel, *Journal of Visual Impairment & Blindness*

Reviewer for:

Association for Computing Machinery (ACM) Transactions on Applied Perception; Behavioural Brain Research; Experimental Brain Research; Journal of the Acoustical Society of America; Journal of Experimental Psychology: Learning, Memory, and Cognition; Journal of Neuroscience; National Science Foundation; Perception; Perception & Psychophysics; Psychonomic Bulletin & Review; Somatosensory and Motor Research

Departmental/Campus Activities

Member, Behavioral Neuroscience Program, Cognitive Psychology Program, and Neurobiology Program; Chair, Academic Affairs Institutional Review Board, 1989-1992; Member, University Hearings Board, 1987-1997; Member, Society of Fellows Faculty Board, 1996(year of founding)-2002; Member, Advisory Board of the Cognitive Science Program, 1998-2000; Psychology Department Director of Graduate Studies, 1995-present.

Research Support

Ongoing

“CNS Processes Underlying Pain Regulation and Persistence.” NINDS Program Project grant NS045685. 10/01/04-06/30/09. Program Director: William Maixner. Mark Hollins’ role in this grant is as PI of Subproject 2, “Effect of Central Sensitization on Pain-Touch Interactions.” The overall goal of this subproject is to compare the strengths of three types of sensory interactions involving pain (touch gating, pain gating, and diffuse noxious inhibitory controls) in individuals with two chronic pain conditions (fibromyalgia and temporomandibular disorders) and in pain-free control individuals.

“Perceptual and Cognitive Processing of Pain in Sickle Cell Disease.” NINR R21 grant. 07/13/07-05/31/09. Mark Hollins (PI), Karen Gil (Co-I). This project seeks to more fully characterize pain processing in persons with SCD.

Completed

“CNS Adaptive Mechanisms and Orofacial Sensation.” NIH Program Project grant DE07509. 12/01/97-11/30/02. Program Director: William Maixner. Mark Hollins’s role in this grant was as PI of the subproject, “Experimental Analysis of Vibratory Analgesia in Normals and Persons with Temporomandibular Disorders.” The overall goal of this subproject was to examine the effect of various basic sensory factors (such as stimulus frequency, intensity, and location) on the ability of vibration to reduce both experimental and clinical pain.

“Neural Networks, Pacinian Coding and Texture Perception.” Intramural grant from the UNC Cognitive Science Program. (Hollins, PI). 10/22/02-06/30/05. The overall goal of this project is to develop a quantitative understanding of how the Pacinian system uses temporal information to distinguish among fine textures.

“Cutaneous Vibration and Its Role in Texture Perception.” NSF grant SBR-9514432. 08/15/96-07/31/00. Hollins was PI of this grant. The overall goal of this research was to examine the role of cutaneous vibration, created by lateral movement between tactile stimuli and skin, in the perception of fine surface texture.

“A Mathematical Model of Mechanoreception.” Intramural grant from the UNC Cognitive Science Program. 03/09/00-09/18/02. Hollins was PI and Sliman Bensmaïa was Co-PI. The overall goal of this project was increase understanding of the way in which receptor coding mechanisms contribute to the discriminability of vibrotactile waveforms.

Publications

Hollins, M., & Bensmaïa, S. J. (2007). The coding of roughness. *Canadian Journal of Experimental Psychology*, 61, 184-195.

Hollins, M., Lorenz, F., & Harper, D. (2006). Somatosensory coding of roughness: The effect of texture adaptation in direct and indirect touch. *Journal of Neuroscience*, 26, 5582-5588.

Higashiyama, A., Hollins, M., & Maixner, W. (2006). Tactile orientation constancy: Do proprioception and attention affect the tactile vertical? *Japanese Psychological Research*, 48, 255-269.

Hollins, M., Lorenz, F., Seeger, A., & Taylor, R. (2005). Factors contributing to the integration of textural qualities: Evidence from virtual surfaces. *Somatosensory & Motor Research*, 22, 193-206.

Tommerdahl, M., Hester, K. D., Felix, E. R., Hollins, M., Favorov, O. V., Quibrera, P. M., & Whitsel, B. L. (2005). Human vibrotactile frequency discriminative capacity after adaptation to 25Hz or 200Hz stimulation. *Brain Research*, 1057,

1-9.

- Bensmaïa, S. J., & Hollins, M. (2005). Pacinian representations of fine surface texture. *Perception & Psychophysics*, *67*, 842-854.
- Bensmaïa, S. J., Hollins, M., & Yau, J. (2005). Vibrotactile information in the Pacinian system: a psychophysical model. *Perception & Psychophysics*, *67*, 828-841.
- Hollins, M., Seeger, A., Pelli, G., & Taylor, R. (2004). Haptic perception of virtual surfaces: Scaling subjective qualities and interstimulus differences. *Perception*, *33*, 1001-1019.
- Hollins, M., Roy, E. A., & Crane, S. A. (2003). Vibratory antinociception: Effects of vibration amplitude and frequency. *The Journal of Pain*, *4*, 381-391.
- Roy, E. A., Hollins, M., & Maixner, W. (2003). Reduction of TMD pain by high-frequency vibration: a spatial and temporal analysis. *Pain*, *101*, 267-274.
- Bensmaïa, S. J., & Hollins, M. (2003). The vibrations of texture. *Somatosensory & Motor Research*, *20*, 33-43.
- Hollins, M. (2002). Touch and haptics. In Pashler, H. (Editor-in-chief), & Yantis, S. (Volume Editor), *Stevens' handbook of experimental psychology, Third edition, Vol. 1* (pp. 585-618). New York, NY: John Wiley & Sons.
- Hollins, M., Bensmaïa, S. J., & Roy, E. A. (2002). Vibrotaction and texture perception. *Behavioural Brain Research*, *135*, 51-56.
- Hollins, M., Bensmaïa, S. J., & Washburn, S. (2001). Vibrotactile adaptation impairs discrimination of fine, but not coarse, textures. *Somatosensory & Motor Research*, *18*, 253-262.
- Hollins, M., Fox, A., & Bishop, C. (2000). Imposed vibration influences perceived tactile smoothness. *Perception*, *29*, 1455-1465.
- Hollins, M., Sigurdsson, A., & Morris, K. A. (2001). Local vibrotactile and pain sensitivities are negatively related in temporomandibular disorders. *The Journal of Pain*, *2*, 46-56.
- Hollins, M., Bensmaïa, S., Karlof, K., & Young, F. (2000). Individual differences in perceptual space for tactile textures: Evidence from multidimensional scaling. *Perception & Psychophysics*, *62*, 1534-1544.
- Bensmaïa, S. J., & Hollins, M. (2000). Complex tactile waveform discrimination. *Journal of the Acoustical Society of America*, *108*, 1236-1245.

- Hollins, M. (2000). Vision impairment and cognition. In B. Silverstone, M. A. Lang, B. P. Rosenthal & E. E. Faye (Eds.-in-chief), *The Lighthouse handbook on vision impairment and vision rehabilitation. Vol. 1. Vision impairment* (pp. 339-358). New York: Oxford University Press.
- Hollins, M., & Risner, S. R. (2000). Evidence for the duplex theory of tactile texture perception. *Perception & Psychophysics*, *62*, 695-705.
- Fillingim, R. B., Fillingim, L. A., Hollins, M., Sigurdsson, A., & Maixner, W. (1998). Generalized vibrotactile allodynia in a patient with temporomandibular disorder. *Pain*, *78*, 75-78.
- Roy, E. A., & Hollins, M. (1998). A ratio code for vibrotactile pitch. *Somatosensory and Motor Research*, *15*, 134-145.
- Hollins, M., & Sigurdsson, A. (1998). Vibrotactile amplitude and frequency discrimination in temporomandibular disorders. *Pain*, *75*, 59-67.
- Hollins, M., and Roy, E. A. (1996). Perceived intensity of vibrotactile stimuli: The role of mechanoreceptive channels. *Somatosensory and Motor Research*, *13*, 273-286.
- Hollins, M., Sigurdsson, A., Fillingim, L., and Goble, A. K. (1996). Vibrotactile threshold is elevated in temporomandibular disorders. *Pain*, *67*, 89-96.
- Hollins, M., Delemos, K. A., and Goble, A. K. (1996). Vibrotactile adaptation of the RA system: A psychophysical analysis. In O. Franzén, R. Johansson, and L. Terenius (Eds.), *Somesthesia and the neurobiology of the somatosensory cortex* (pp. 101-111). Basel: Birkhäuser Verlag.
- Delemos, K. A., and Hollins, M. (1996). Adaptation-induced enhancement of vibrotactile amplitude discrimination: The role of adapting frequency. *Journal of the Acoustical Society of America*, *99*, 508-516.
- Goble, A. K., and Hollins, M. (1994). Vibrotactile adaptation enhances frequency discrimination. *Journal of the Acoustical Society of America*, *96*, 771-780.
- Hollins, M. and Favorov, O. (1994). The tactile movement aftereffect. *Somatosensory and Motor Research*, *11*, 153-162.
- Hollins, M., Faldowski, R., Rao, S., and Young, F. (1993). Perceptual dimensions of tactile surfaced texture: A multidimensional scaling analysis. *Perception & Psychophysics*, *54*, 697-705.

- Goble, A. K., and Hollins, M. (1993). Vibrotactile adaptation enhances amplitude discrimination. *Journal of the Acoustical Society of America*, 93, 418-424.
- Hollins, M., Delemos, K. A., and Goble, A. K. (1991). Vibrotactile adaptation on the face. *Perception & Psychophysics*, 44, 21-30.
- Hollins, M., Goble, A. K., Whitsel, B. L. and Tommerdahl, M. (1990). Time course and action spectrum of vibrotactile adaptation. *Somatosensory and Motor Research*, 7, 205-221.
- Hollins, M. (1989). *Understanding blindness: An integrative approach*. Hillsdale, NJ: Erlbaum.
- Hollins, M., and Goble, A. K. (1988). Perception of the length of voluntary movements. *Somatosensory Research*, 5, 335-348.
- Hollins, M., and Kelley, E. K. (1988). Spatial updating in blind and sighted people. *Perception & Psychophysics*, 43, 380-388.
- Whitsel, B. L., Franzén, O., Dreyer, D. A., Hollins, M., Young, M., Essick, G. K. and Wong, C. (1986). Dependence of subjective traverse length on velocity of moving tactile stimuli. *Somatosensory Research*, 3, 185-196.
- Hollins, M. (1986). Haptic mental rotation: More consistent in blind subjects? *Journal of Visual Impairment and Blindness*, 80, 950-952.
- Hollins, M. (1985). Styles of mental imagery in blind adults. *Neuropsychologia*, 23, 561-566.
- Hollins, M. (1985). Taste as perception. *Currents: The Journal of Food, Nutrition & Health*, 1, 14-17.
- Rogers, D. C., and Hollins, M. (1982). Is the binocular rivalry mechanism tritanopic? *Vision Research* 22, 515-520.
- Hollins, M., and Bailey, G. W. (1981). Rivalry target luminance does not affect suppression depth. *Perception & Psychophysics*, 30, 201-203.
- Glickstein, M., Cohen, J. L., Dixon, B., Gibson, A., Hollins, M., LaBossiere, E. and Robinson, F. (1980). Corticopontine visual projections in macaque monkeys. *Journal of Comparative Neurology*, 190, 209-229.
- Hollins, M., and Hudnell, K. (1980). Adaptation of the binocular rivalry mechanism. *Investigative Ophthalmology and Visual Science*, 19, 1117-1120.

- Hollins, M. (1980). The effect of contrast on the completeness of binocular rivalry suppression. *Perception & Psychophysics*, 27, 550-556.
- Whitsel, B. L., Dreyer, D. A., Hollins, M., and Young, M. G. (1980). The coding of direction of tactile stimulus movement: Correlative psychophysical and electrophysiological data. In D. R. Kenshalo (Ed.), *Sensory functions of the skin of humans* (pp. 79-107). New York: Plenum.
- Hollins, M. (1979). Sensation and perception: An informal approach. *Contemporary Psychology*, 24, 225-226 [review of *Introduction to Sensory Processes*].
- Hollins, M. and Leung, E. H. L. (1978). The influence of color on binocular rivalry. In J. C. Armington, J. Krauskopf and B. R. Wooten (Eds.), *Visual psychophysics and physiology. A volume dedicated to Lorrin Riggs* (pp. 181-190). New York: Academic Press.
- Whitsel, B. L., Dreyer, D. A. and Hollins, M. (1978). Representation of moving stimuli by somatosensory neurons. *Federation Proceedings*, 37, 2223-2227.
- Dreyer, D. A., Hollins, M., and Whitsel, B. L. (1978). Factors influencing cutaneous directional sensitivity. *Sensory Processes*, 2, 71-79.
- Hollins, M. and Bunn, K. W. (1977). The relation between convergence micropsia and retinal eccentricity. *Vision Research*, 17, 403-408.
- Hollins, M. (1976). Does accommodative micropsia exist? *American Journal of Psychology*, 89, 443-454.
- Hollins, M. (1974). Does the central retina stretch during accommodation? *Nature*, 251, 729-730.
- Hollins, M., and Alpern, M. (1973). Dark adaptation and pigment regeneration in human cones. *Journal of General Physiology*, 62, 430-447.
- Hollins, M., and Montabana, D. J. (1973). Spectral sensitivity of the foveal blue-sensitive mechanism determined by color mixture. *Vision Research*, 13, 1391-1393.
- Hollins, M. (1971). Brightness contrast at low luminances. *Vision Research*, 11, 1459-1472.

Presentations/Abstracts

- Hollins, M., Harper, D. E., Gallagher, S. M., & Maixner, W. (2007). Hypervigilance does not increase the loudness of unpleasant sounds.

Paper presented at the 48th Annual Meeting of the Psychonomic Society, Long Beach CA, November 15-18. [*Abstracts of the Psychonomic Society*, 12, 35.]

Hollins, M., & Lorenz, F. M. (2005). Adaptation to textured surfaces: A comparison of direct and indirect touch. Paper presented at the 46th Annual Meeting of the Psychonomic Society, Toronto, November 10-13. [*Abstracts of the Psychonomic Society*, 10, 20.]

Hollins, M. (2005). Perceptual qualities of surfaces: Is stickiness special? Paper presented at the *Softness and Smoothness Workshop* sponsored by Unilever Corporation, Weehawken, NJ, June 1-2.

Hollins, M. (2003). Graduate seminar presented in the Department of Electrical and Computer Engineering, Purdue University (West Lafayette, IN), Oct 23.

Bensmaïa, S., Hollins, M. & Yau, J. (2003). The Pacinian system and the discrimination of high-frequency complex tactile waveforms: A neural model. Poster presented at the annual North Carolina Cognition Conference, Durham, February.

Hollins, M., Roy, E. A., & Crane, S. A. (2002). Vibration affects sensitivity to a noxious stimulus. Paper presented at the annual meeting of the Tactile Research Group, Kansas City, MO, Nov 21.

Bensmaïa, S. J., Hollins, M., & Johnson, M. L. (2000). The vibrations of texture. Paper presented (by S. J. Bensmaïa) at the annual meeting of the Tactile Research Group, New Orleans, November 16.

Hollins, M., & Bensmaïa, S. J. (2000). Vibrotactile adaptation impairs discrimination of fine textures. Paper presented at the 41st Annual Meeting of the Psychonomic Society, New Orleans, November 16-19. [*Abstracts of the Psychonomic Society*, 5, 17.]

Seeger, A., Henderson, A., Pelli, G. L., Hollins, M., & Taylor, R. M., II. (2000). Haptic display of multiple scalar fields on a surface. Paper presented (by A. Seeger) at Conference on Information and Knowledge Management (CIKM) Workshop on New Paradigms in Information Visualization and Manipulation, Vienna, VA, November 10.

Roy, E.A., Hollins, M., Crane, S.A., & Maixner, W. (2000). Both High and Low Vibration Frequencies Reduce Tonic Pain. Poster presented at the 1st Annual Southeastern Academic Pain Symposium, *Pain Related Suffering*, Durham, NC, October 20-22.

- Hollins, M., Pelli, G. L., Seeger, A., & Taylor, R. M., II. (2000). Perceptual space for texture dimensions: What is the metric? Paper presented (by G. L. Pelli) at the 2nd Phantom Users Research Symposium (PURS 2000), Zurich, Switzerland, July 6-7 (<http://www.vision.ee.ethz.ch/~purs2000/>).
- Roy, E. A., Maixner, W., & Hollins, M. (1999). Effects of Vibration on Pain Associated with TMD. Poster presented at the 18th Annual Meeting of the American Pain Society, Fort Lauderdale, October 21-24.
- Hollins, M. (1999). "Experimental Analysis of Vibrotactile Analgesia," talk given at the Tactile Research Group, Los Angeles, November 18, 1999.
- Hollins, M. (1999). Vibrotaction and Texture Perception. Talk given at the International Symposium on Brain Mechanisms of Tactile Perception, Stockholm, October 11-13.
- Roy, E. A., Maixner, W., & Hollins, M. (1999). Effects of vibration on pain associated with TMD. Poster presented at the 18th Annual Scientific Meeting of the American Pain Society, Fort Lauderdale, October 21-24, 1999.
- Hollins, M., Bensmaïa, S., & Risner, R. (1998). The duplex theory of tactile texture perception. In Grondin, S., & Lacouture, Y. (Eds.), *Fechner Day 98. Proceedings of the Fourteenth Annual Meeting of the International Society for Psychophysics* (pp. 115-120). Québec, Canada: The International Society for Psychophysics.
- Hollins, M. (1997). Overview of tactile sensibility. Presentation at *Somatosensation and the Underlying Neural Mechanisms* conference, November 13-15, Chapel Hill, NC.
- Hollins, M., and Roy, E. A. (1996). Channel contributions to perceived intensity of vibrotactile stimuli. *Abstracts of the Psychonomic Society, 1*, 74.
- Roy, E. A., and Hollins, M. (1996). A model of vibrotactile loudness. *Journal of Mathematical Psychology, 40*, 350. Paper presented at the 29th annual meeting of the Society for Mathematical Psychology, University of North Carolina at Chapel Hill, August 1-4.
- Hollins, M., Fillingim, L. A., and Goble, A. K. (1994). Vibrotactile threshold and TMD. *Program of the 35th Annual Meeting of the Psychonomic Society*, p. 4.
- Hollins, M., Delemos, K. A., and Goble, A. K. (1994). Vibrotactile adaptation as an analytical tool. Paper presented at the International Symposium on Somesthesia and the Neurobiology of the Somatosensory Cortex, Stockholm, Sweden, August 29-31.

- Goble, A. K., and Hollins, M. (1993). Vibrotactile adaptation enhances frequency discrimination. *Bulletin of the Psychonomic Society*, 31, 356.
- Hollins, M. (1992). A tactile movement aftereffect. *Bulletin of the Psychonomic Society*, 30, 446.
- Hollins, M., Goble, A. K., and Delemos, K. A. (1991). Vibrotactile adaptation. *Journal of the Acoustical Society of America*, 89, 2002.
- Hollins, M., Goble, A. K., Delemos, K. A., and Whitsel, B. L. (1989). Time course of vibrotactile adaptation on two body sites. *Bulletin of the Psychonomic Society*, 27, 499.
- Hollins, M., and Goble, A. K. (1988). Pointing to previously seen or touched objects. *Bulletin of the Psychonomic Society*, 26, 487.
- Hollins, M., and Goble, A. K. (1987). The perception of walked distance. *Bulletin of the Psychonomic Society*, 25, 338.
- Hollins, M., Pick, D. F., and Mumaw, R. (1986). Changes in hand orientation during haptic mental rotation. *Bulletin of the Psychonomic Society*, 24, 346.
- Hollins, M., and Kelley, E. K. (1985). Knowledge of layout in congenitally blind subjects. *Bulletin of the Psychonomic Society*, 23, 278.
- Hudnell, H. K., and Hollins, M. (1985). The influence of saccadic eye movements on binocular rivalry. *Investigative Ophthalmology and Visual Science*, 25, Supplement, p. 241.
- Rogers, D. C., and Hollins, M. (1981). Color does not influence binocular rivalry for red-green dichromats. *Investigative Ophthalmology and Visual Science*, 20, Supplement, p. 225.
- Hudnell, H. K., and Hollins, M. (1979). Fatigue of the suppression mechanism following prolonged binocular rivalry. *Investigative Ophthalmology and Visual Science*, Supplement, p. 173.
- Dreyer, D. A., Hollins, M., Whitsel, B. L., and Young, M. (1978). Velocity dependence of a dimension of cutaneous sensibility. *Society for Neuroscience Abstracts*, 4, 550.
- Dreyer, D. A., Hollins, M., Whitsel, B. L., and Allen, E. E. (1976). Behavioral measures of cutaneous sensitivity. *Society for Neuroscience Abstracts*, 2, 933.

Hollins, M., and Bunn, K. W. (1976). The effect of retinal eccentricity on convergence micropsia. *Bulletin of the Psychonomic Society*, 8, 253.

Hollins, M. (1971). Brightness contrast at low levels of luminance. Paper presented at the meeting of the Association for Research in Vision and Ophthalmology, Sarasota, Florida, April 26-30.