

## **Emily D. Grossman, Ph.D.**

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### **Education**

2002 Ph.D. Psychology, Vanderbilt University; Nashville, Tennessee  
1997 B.A. Psychology, Miami University; Oxford, Ohio  
1997 B.A. Mathematics & Statistics, Miami University; Oxford, Ohio

### **Professional Employment**

2011 - Director, Center for Cognitive Neuroscience  
School of Social Sciences, University of California Irvine  
2010 - Associate Professor of Cognitive Sciences, University of California Irvine  
Irvine, California  
2005 - 2011 Associate Director, Center for Cognitive Neuroscience  
School of Social Sciences, University of California Irvine  
2004 - 2010 Assistant Professor of Cognitive Sciences, University of California Irvine  
Irvine, California  
2002-2004 Postdoctoral Researcher in Vision Sciences Laboratory  
Harvard University, Cambridge, Massachusetts  
2003 Postdoctoral Researcher at McLean Hospital  
Harvard University Medical School, Waltham, Massachusetts

### **Honors & Awards**

2010 Randolph Blake Early Career Award, Vanderbilt University  
2008 Faculty Career Development Award, UC Irvine  
2007 Assistant Professor Mentoring Award, Associated Graduate Students, UC Irvine  
2005 Social Science Assistant Professor Research Award, UC Irvine  
2004 Certificate of Distinction in Teaching, Harvard University  
2002 Vanderbilt University Graduate School Travel Award  
2001 Lisa Quesenberry Award for Achievement, Quesenberry Foundation  
2001 Hodges Teaching Assistance Award, Vanderbilt University  
2001 Vanderbilt University Graduate School Travel Award  
2000 Computational Vision Course, Cold Spring Harbor, New York  
1999 John F. Kennedy Center Award for Graduate Student Research  
1997 E.F. Patten Prize in Psychology, Miami University  
1997 Award for Academic Achievement, Cincinnati Psychological Association  
1996 Undergraduate Summer Scholar Award, Miami University

### **Grants & Fellowships**

2008-2013 "CAREER: Perceptual and Neural Analysis of Biological Motion", National Science Foundation; Division of Behavioral and Cognitive Sciences. Faculty Early Career Development Program.  
2008-2013 "Integrative functions of the planum temporale", National Institutes of Health (NIH), National Institute on Deafness and Other Communication Disorders (NIDCD). Role: Co-I. PI: Hickok.  
2008-2009 "An integrative model of brain and behavior underlying transcranial magnetic stimulation", Multi-Investigator Faculty Research Grant, University of California Irvine. Co-PI with Ramesh Srinivasan  
2004 "MEG Studies of Seeing Biological Motion", National Institutes of Health (NEI), Postdoctoral National Research Service Award (NRSA). (Declined)  
2001-2002 "Doctoral Dissertation Research: Imaging Brain Areas Involved in Biological Motion Perception", National Science Foundation (NSF) Dissertation Enhancement Grant.

2001 Vanderbilt University Graduate School Dissertation Enhancement Grant.  
1997-2000 NEI Predoctoral Training Fellowship, Vanderbilt Vision Research Center

### **University of California Irvine Service**

2005- Imaging Steering Committee, Research Imaging Center  
2006 School of Social Sciences Representative to the Divisional Senate Assembly  
2005-2006 Undergraduate Psychology Honors Program Committee  
2004-2006 Cognitive Sciences Faculty Search Committee

### **Professional Service**

*Ad Hoc* Reviewer: *Advances in Cognitive Psychology, Annals of Neurology, Attention Perception & Psychophysics, Behavioural Brain Research, Brain and Language, Brain Research, Cerebral Cortex, Child Development, Cognition, Current Biology, European Journal of Neuroscience, Frontiers in Perception Science, Human Brain Mapping, Journal of Cognitive Neuroscience, Journal of Experimental Psychology: Human Perception and Performance, Journal of Neuroscience, Journal of Vision, National Science Foundation, Neuroimage, Neuron, Neuropsychologia, Perception, PLoS One, Proceedings of the National Academy of Sciences, Psychiatry Research, Psychological Science, Research Grants Council of Hong Kong, Schizophrenia Research, Seeing and Perceiving, Social Neuroscience, Trends in Cognitive Science, Vision Research.*

Review Panel Member:

National Science Foundation, Perception, Action and Cognition  
National Science Foundation, Cognitive Neuroscience  
National Science Foundation, Graduate Research Fellowship

### **Professional Affiliations**

Vision Sciences Society (2001-present)  
Society for Neuroscience (1999-2008)  
Association for Research in Vision and Ophthalmology (1997-2000)

### **Peer-Reviewed Journal Publications, etc.**

Grossman, E.D., Kim, E.K., Tyler, S.C. & Hecker, E.A. (under review) The potency of biological motion to drive endogenous shifts of attention.

Garcia, J.O., Pyles, J.A. & Grossman, E.D. (2012) Stimulus complexity modulates contrast response functions in the human middle temporal area (hMT+). *Brain Research, 1466(23)*, 56-69.

Tyler, S.C. & Grossman, E.D. (2011) Feature-based attention promotes biological motion recognition. *Journal of Vision, 11(10)*, 1-16.

Garcia, J.O., Grossman, E.D. & Srinivasan, R. (2011) Evoked potentials in large-scale cortical networks elicited by TMS over visual cortex. *Journal of Neurophysiology, 106(4)*, 1734-1746.

Thurman, S.M. & Grossman, E.D. (2011) Diagnostic spatial frequencies and human efficiency for discriminating actions. *Attention, Perception & Psychophysics, 73(2)*, 572-580.

Born: Annette Justine, September 2010.

Thurman, S.M., Giese, M.A. & Grossman, E.D. (2010) Perceptual and computational analysis of critical space-time features for biological motion. *Journal of Vision, 10(12)*, 1-14.

Grossman, E.D., Jardine, N.A. & Pyles, J.A. (2010) fMRI-adaptation reveals invariant coding for biological motion on the human STS. *Frontiers in Human Neuroscience, 4(15)*, 1-18.

Garcia, J.O. & Grossman, E.D. (2009) Motion opponency and transparency in the human middle temporal area (hMT). *European Journal of Neuroscience, 30(6)*, 1172-1182.

- Pyles, J.A. & Grossman, E.D. (2009) Neural adaptation for novel objects during dynamic articulation. *Neuropsychologia*, 47(5), 1261-1268.
- Bedney, M., Caramazza, A., Grossman, E., Pascual-Leone, A. & Saxe, R. (2008) Concepts are not “webs of sensation”: Evidence from motion and non-motion words. *Journal of Neuroscience*, 28(44), 11347-1353.
- Chen, Y., Grossman E., Yurgen-Todd, D., Bidwell, C. Gruper, S., Levy, D., Matthyse, S., Nakayama, K., & Holzman, P. (2008) Differential activation patterns in occipital and prefrontal cortices during motion processing: Evidence from normal and schizophrenic brains. *Cognitive, Affective and Behavioral Neuroscience*, 8(3), 293-303.
- Thurman, S. M. & Grossman E. D. (2008) Temporal “Bubbles” reveal key features for point-light biological motion perception. *Journal of Vision*, 8(3), 1-11.
- Garcia, J. O. & Grossman, E. D. (2008) Necessary but not sufficient: Motion perception is required for perceiving biological motion. *Vision Research*, 48(9), 1144-1149.
- Pyles, J. A., Garcia, J. O., Hoffman, D. D. & Grossman, E. D. (2007) Visual perception and neural correlates of novel “biological motion”. *Vision Research*, 47(21), 2786-2797.
- Born: Bridgette Marie, June 2006.
- Grossman, E. D., Battelli, L. & Pascual-Leone, A. (2005) Repetitive TMS over posterior STS disrupts perception of biological motion. *Vision Research*, 45 (22), 2847-2853.
- Grossman, E.D., Blake, R & Kim, C-Y. (2004) Learning to see biological motion: Brain activity parallels behavior. *Journal of Cognitive Neuroscience*, 16(9), 1669-1679.
- Born: Cassidy Reese, October 2002.
- Grossman, E. & Blake, R. (2002) Brain Areas Active during Visual Perception of Biological Motion. *Neuron*, 35(6), 1157-1165. [Reprinted in *Social Neuroscience* (J.T. Cacioppo & G. Berntson, Eds.) Psychology Press, 2005].
- Tadin, D., Lappin, J.S., Blake, R. & Grossman E.D. (2002) What constitutes an efficient reference frame for vision? *Nature Neuroscience*, 5(10), 1010-1015.
- Grossman, E.D. & Blake, R. (2001) Brain activity evoked by inverted and imagined biological motion. *Vision Research*, 41(10-11), 1475-1482.
- Grossman, E.D., Donnelly, M., Price, P., Morgan, V., Pickens, D., Neighbor, G. & Blake, R. (2000) Brain areas involved in perception of biological motion. *Journal of Cognitive Neuroscience*, 12(5), 711-720.
- Grossman, E.D. & Blake, R. (1999) Perception of coherent motion, biological motion and form-from-motion under dim-light conditions. *Vision Research*, 9(22), 3721-3727.

### **Book Chapters**

- Grossman, E.D. (in press). Biological motion and social cognitive function of the human superior temporal sulcus. *Social Perception: Detection and Interpretation of Animacy, Agency and Intention*. Eds. M. Rutherford and V. Kuhlemeier. MIT Press.
- Pyles, J.A. & Grossman, E.D. (in press). Neural mechanisms for biological motion and animacy. *Perception of the Human Body in Motion: Findings, Theory and Practice*. Eds. M. Shiffrar and K. Johnson. Oxford University Press.
- Grossman E.D. (2008) Neurophysiology of action recognition. *Understanding Events* (p. 335-362). Eds. T. Shipley and J. Zacks. Oxford University Press.
- Grossman, E.D. (2006) Evidence for a network of brain areas involved in perception of biological motion. *The Human Body: Perception from the Inside Out* (p. 361-384). Eds. M. Grosjean, G. Knoblich, M. Shiffrar and I. Thornton. Oxford University Press.
- Blake, R., Sekuler, R. & Grossman, E. (2003) Motion processing in human visual cortex. *Primate Visual System*. Eds. J.H. Kaas and C.E. Collins. CRC Press, Boca Raton, Florida.

### **Abstracts & Conference Proceedings**

- Tyler, S.C., Dasgupta, S., Battelli, L., Agosta, S. & Grossman, E.D. (2012) Spatial cueing and task difficulty effects on the temporal attention selective temporal parietal junction. *Vision Sciences Society*.
- Grossman, E.D., Kim, E.M., Hecker, E.A. & Tyler, S.C. (2012) The temporal structure of social reflexive orienting from point-light biological motion. *Vision Sciences Society*.
- Dasgupta, S., Tyler, S.C. & Grossman, E.D. (2011) Co-localization of the human posterior STS during biological motion, face and social perception. *Vision Sciences Society*.
- Tyler, S.C., Dasgupta, S., Battelli, L. & Grossman, E.D. (2011) Lateralized temporal parietal junction (TPJ) activity during temporal order judgment tasks. *Vision Sciences Society*.
- Thurman, S. Garcia, J. & Grossman, E. (2011) Determining the feature sensitivity of visual areas to biological motion using brain-based reverse correlation. *Vision Sciences Society*.
- Srinivasan, R., Garcia, J.O. & Grossman, E. (2010) Widespread oscillations induced by single-pulse TMS reflect the functional connectivity of the brain. *Federation of European Neurosciences*.
- Garcia, J.O., Grossman, E.D. & Srinivasan, R. (2010) Spatio-temporal characteristics of TMS-induced oscillations in the human brain as measured with simultaneous EEG. *Human Brain Mapping*.
- Dasgupta, S., Pyles, J. & Grossman, E. (2010) Multi-voxel pattern analysis (MVPA) of the STS during biological motion perception. *Vision Sciences Society*.
- Tyler, S., Garcia, J. & Grossman, E. (2010) Attention-based analysis of biological motion. *Vision Sciences Society*.
- Thurman, S. & Grossman, E. (2009) Spatio-temporal “Bubbles” reveal diagnostic information for recognizing point-light and fully-illuminated biological motion. *Vision Sciences Society. Journal of Vision, 9(8)*, abstr. 662.
- Garcia, J., Srinivasan, R. & Grossman, E. (2008) Oscillations induced by single-pulse TMS over visual cortex measured with simultaneous EEG. *Society for Neuroscience Abstracts*.
- Bedny, M., Caramazza, A. Grossman, E., Pascual-Leone, A. & Saxe, R. (2008). Concepts are not “webs of sensation”: Evidence from motion words. *Cognitive Science Society*.
- Garcia, J. Srinivasan, R. & Grossman, E.D. (2008) TMS-induced oscillations in orientation discriminations. *Vision Sciences Society. Journal of Vision 8(6)*, abstr. 482.
- Jardine, N. L., Pyles, J.A. & Grossman, E.D. (2008) Action invariance: An fMRI investigation of biological motion specificity in the STSp. *Vision Sciences Society. Journal of Vision 8(6)*, abstr. 908.
- Pyles, J.A. & Grossman, E.D. (2008) Visual analysis of biological motion and understanding social events: Mapping the STSp. *Vision Sciences Society. Journal of Vision 8(6)*, abstr. 909.
- Thurman, S., Pyles, J., Troje, N. & Grossman, E.D. (2008) Critical temporal window for natural point-light gender discrimination. *Vision Sciences Society. Journal of Vision 8(6)*, abstr. 907.
- Bedny, M., Caramazza, A., Grossman, E., Pascual-Leone, A., & Saxe, R. (2008) Are word meanings “webs of sensations”? Counter-evidence from an fMRI study of motion and non-motion words. *Cognitive Neuroscience Society*.
- Garcia, J. O., Pouya, A., Grossman, E. (2007) Investigation of local motion antagonism with transcranial magnetic stimulation. *European Conference on Visual Perception*.
- Garcia, J., Pyles J. & Grossman, E. (2007) Neural mechanisms underlying motion opponency in hMT+. *Vision Sciences Society. Journal of Vision, 7(9)*, abstr. 396.
- Pyles, J., Garcia, J. & Grossman, E. (2007) fMRI-adaptation for articulated moving objects in ventral temporal brain areas. *Vision Sciences Society. Journal of Vision, 7(9)*, abstr. 1034.
- Thurman, S. & Grossman, E. (2007) Dynamic “bubbles”: A novel technique for analyzing the perception of biological motion. *Vision Sciences Society. Journal of Vision, 7(9)*, abstr. 478.

- Pyles, J., Garcia, J., Hoffman, D. & Grossman E. (2006) Brain responses dissociate human from non-human biological motion. *Society for Neuroscience Abstracts*.
- Pyles, J.A., Garcia, J.O., Hoffman, D.D. & Grossman, E.D. (2006) Brain activity evoked by perception of novel 'biological motion'. Vision Sciences Society. *Journal of Vision*, 6(6), abstr. 794.
- Garcia, J.O., Pyles, J. & Grossman, E.D. (2006) Neural correlates of degraded complex motion perception. Vision Sciences Society. *Journal of Vision*, 6(6), abstr. 1037.
- Pyles, J., Grossman, E., & Hoffman, D. (2005) Visual characteristics of biological motion: investigations with a new stimulus set. *Annual Meeting of the Psychonomic Society*.
- Garcia, J. O. & Grossman, E. D. (2005) Perception of point-light biological motion at isoluminance. Vision Sciences Society. *Journal of Vision* 5(8), abstr. 21.
- Chen, Y. Grossman, E. Bidwel, L.C., Yurgelun-Todd, D., Gruber, S., Levy, D., Nakayama, K. & Holzman, P. (2005) Underactivation of the sensory system and overactivation of the complementary cognitive system during motion perception in schizophrenia. *European Conference on Visual Perception*.
- Grossman E., Battelli, L., & Pascual-Leone, A. (2004) STSp and biological motion perception: An rTMS study. Paper: *Annual Interdisciplinary Conference*, Jackson Hole, Wyoming.
- Grossman, E., Battelli, L. & Pascual-Leone, A. (2004) TMS over STSp disrupts perception of biological motion. Vision Sciences Society. *Journal of Vision* 4(8), abstr. 239.
- Chen, Y., Grossman, E., Yurgelun-Todd, D., Bidwell, C., Levy, D., Matthysse, S., Nakayama, K. & Holzman, P. (2004) Motion processing in schizophrenia. *Annual Meeting of Biological Psychiatry*.
- Grossman, E. D., Harris, A.M. & Nakayama, K. (2003) Simultaneous EEG/MEG recording during perception of point-light biological motion. *Society for Neuroscience Abstracts*, 29, abstr. 591.21.
- Grossman, E., Kim, C-K. & Blake, R. (2003) Perceptual learning of biological motion. Vision Sciences Society. *Journal of Vision* 3(9), abstr. 81.
- Kim, C-K., Grossman, E. & Blake, R. (2002) Biologically relevant events are undetectable during suppression phases of binocular rivalry. *Society for Neuroscience Abstracts*, 28, abstr. 161.12.
- Grossman, E. & Blake, R. (2002) A parametric fMRI study of neural activity in human posterior superior temporal sulcus during visual perception of biological motion. *Federation of European Neurosciences*.
- Grossman, E. & Blake, R. (2002) An investigation of neural activity associated with viewing point-light animal, face and hand movements. Vision Science Society. *Journal of Vision*, 2(7), abstr. 341.
- Grossman, E. & Blake, R. (2001) A dissociation between brain areas involved in seeing objects and seeing human movement. *Society for Neuroscience Abstracts*, 27, abstr. 165.33.
- Tadin, D., Lappin, J.S., Blake, R. & Grossman, E.D. (2001) Structured dynamic reference frames for visual perception. *Journal of Vision*, 1(3), abstr. 359.
- Grossman, E., Neighbor, G. & Blake, R. (2000) Neural activity on posterior STS correlated with inverted, distorted and imagined biological motion. *Society for Neuroscience Abstracts*, 26, abstr. 593.4.
- Grossman, E., Blake, R. & Alais, D. (2000) Auditory motion modulates visual motion adaptation. *Investigative Ophthalmology and Visual Science*, 41, abstr. 4207
- Grossman, E., Blake, R., & Neighbor, G. (2000) Inverted vs. upright biological motion, real and imagined: Does the brain see the differences? Paper and poster: PreARVO Symposium on *Functional Brain Imaging in Vision*. Fort Lauderdale, Florida.
- Grossman, E.D., Donnelly, M., Morgan, V., Price, R., Neighbor, G. & Blake, R. (1999) fMRI comparison of neural loci activated by biological motion, kinetic boundaries, and uniform motion. *Investigative Ophthalmology and Visual Science*, 40, abstr. 3913.
- Grossman, E., Blake, R. & Palmeri, T. (1998) Motion perception at scotopic light levels. *Investigative Ophthalmology and Visual Science*, 39, abstr. 4974.

Grossman, E.D., Thomas R.D., & Ell, S. (1997) Exploring the consequences of integrality and perceptual dependencies on component same-different judgments. Paper: *Society for Mathematical Psychology*, Bloomington, Indiana.

Grossman, E.D. & Thomas, R.D. (1996) Perceptual Interactions Between Dimensions of Geometric Forms. Poster: Miami University Undergraduate Research Poster Session. Miami University; Oxford, Ohio.

### **Invited Talks and Workshops**

Boynton Colloquium, Center for Visual Science, University of Rochester. Rochester, NY. Sept 2012.

Brain Mapping Colloquium Series, University of California Irvine. Irvine, California. May 2012.

Italian Institute of Technology, Rovereto, Italy. March 2012.

Southern California Cognitive Neuroscience Meeting, San Diego State University, California. March, 2012.

Cognitive Colloquium Series, Department of Psychology, Vanderbilt University. Nashville, TN. October 2011.

Cognitive Brownbag Series, Department of Psychology, UC Riverside. October 2011.

Mind, Technology and Society Series, University of California Merced. Merced, California. October 2011.

Workshop on Social Perception, McMaster University, Hamilton, Ontario. June 2011.

Cognitive Brown Bag, Psychology Department, University of California San Diego, California. April 2010.

Max Planck Institute for Human Cognitive and Brain Sciences Workshop: "Perceiving bodies in action: From low to high level mechanisms". Leipzig, Germany. December 2009.

Italian Institute of Technology & University of Parma, Parma, Italy. 2009.

University of Tübingen, Tübingen, Germany, 2009.

Psychology Department, University of California Los Angeles, Los Angeles, California, 2008.

Department of Cognitive Sciences, University of California Irvine. Irvine, California, 2007.

Washington University Workshop: "The Cognitive Neuroscience of Film". St. Louis, Missouri, 2005.

Sloan-Swartz Center for Theoretical Neurobiology, The Salk Institute. La Jolla, California, 2005.

Social and Affective Neuroscience Lecture Series, Harvard University. Cambridge, Massachusetts, 2004.

Max Planck Institute workshop: "The human body: Perception from the inside out". Kloster Irsee, Germany, 2003.

Department of Psychology, University of Massachusetts. Boston, Massachusetts, 2003.

Department of Cognitive Sciences, University of California Irvine. Irvine, California, 2003.

New England College of Optometry. Boston, Massachusetts, 2003.

University of Massachusetts Medical School, Eunice Kennedy Shriver Center. Worcester, Massachusetts, 2003.

Department of Cognitive Sciences, University of California Irvine. Irvine, California, 2003.

Harvard Vision Sciences Laboratory, Harvard University. Cambridge, Massachusetts, 2002.

Vanderbilt Vision Research Center, Vanderbilt University. Nashville, Tennessee, 2000.

### **Teaching Experience**

#### **Faculty Instructor, University of California Irvine**

*Introduction to Cognitive Neuroscience* (Undergraduate)

*Cognitive Neuroscience of Vision* (Undergraduate)

*Cognitive Sciences Proseminar* (Undergraduate Honors and Graduate)

*Advanced Neuroimaging Laboratory* (Graduate)

*Cognitive Neuroscience* (Graduate)

*Visual Neuroscience Research* (Undergraduate and Graduate)

#### **Teaching Fellow**

*The Human Mind*. Harvard University. Professor Steven Pinker. Spring 2004.

*Vision and Brain*. Harvard University. Professor Patrick Cavanagh. Spring 2004.

*Introduction to Neuroscience*. Vanderbilt University. Professor Rene Marois. Spring 2001.

*Psychology Research Methods*. Vanderbilt University. Professor Randolph Blake. Fall 2000.

### **Various Invited Teaching Lectures**

New England College of Optometry, *Visual Testing and Diagnosis*. Professor Frank Thorn. Spring 2003, 2004  
Vanderbilt University, *Psychology Research Methods*. Professor Isabel Gauthier. Spring 2001.  
Vanderbilt University, *Psychology Research Methods*. Professor Randolph Blake. Fall 2000.

### **Students Advised**

PhD Students Advised: Javier Garcia, John Pyles, Steven Thurman

Current Chair: Samhita Dasgupta, Rakibul Hasan, Elizabeth Hecker, Sarah Tyler

Committee Member: Derrik Asher, Brian Barton, Pamela Jeter, Judy Pa, Kevin Smith, David Sutoyo, Kenny Vaden, Alissa Winkler

Outside Committee Member: Daniel Jokisch (International Graduate School of Neuroscience at Ruhr-University, Bochum, Germany), Dante Pirouz (UCI Merage School of Business)

Undergraduate Honors Students (current and alumni): Grace Chang, Nicole Jardine, Kathryn Recker, Amanda VanLamsweerde

Undergraduate Researchers (current and alumni): Kristen Ahn, Michael Barnett, Jordan Bradsher, Terri Chang, Martin Deza, Andrea Gaspar, Elizabeth Hecker, Derek Heyendal, Diane Hoang, Eugene Kim, Janae Kirkendall (undergraduate at Brigham Young University), Francis Lee, Sean Patel, Gabrielle Perez, Ari Pouya, Tuan Quach, David Quijano, Vinayak Ravuri, Cassandra Redublo, Lauren del Rosario, Marisa Sanwo, Ramya Tadinada, Jeanette Tinoco-Garcia, On Pao Truong, Kelly Wager, Jonathan Wicks, Malena Wilson, Nozomi Yagi

High School Students: Susan Xing (University High School, Irvine)