Daniel J. Graham, Ph.D.

Department of Psychology
Hobart and William Smith Colleges, Geneva, NY USA 14456
Phone: +1-315-781-4526   *E-mail*: graham@hws.edu
Website: http://people.hws.edu/graham/
Twitter: @BrainAsInternet   *Blog*: internetinyourhead.com

EDUCATION

2008	Cornell University	Ph.D., Psychology
	Advisor: David J. Field	
2004	Cornell University	M.S., Physics
2001	Middlebury College	B.A., Physics

APPOINTMENTS

Associate Professor with tenure	**Hobart and William Smith Colleges** Department of Psychology	2018-current Geneva, NY, USA
Visiting Researcher & Instructor	**University of Vienna** Dept. of Psychological Basic Research	2015 Vienna, Austria
Assistant Professor	**Hobart and William Smith Colleges** Department of Psychology	2012-2018 Geneva, NY, USA
Postdoctoral Researcher	**University of Vienna** Dept. of Psychological Basic Research	2011-2012 Vienna, Austria
Postdoctoral Researcher	**Dartmouth College** Dept. of Psychological & Brain Sciences	2010-2011 Hanover, NH, USA
Postdoctoral Researcher	**Dartmouth College** Department of Mathematics	2008-2010 Hanover, NH, USA
NIH Kirschstein-NRSA Pre-doctoral Fellow	**Cornell University** Department of Psychology	2004-2008 Ithaca, NY, USA
NSF IGERT Program Pre-doctoral Fellow	**Cornell University** Department of Physics	2001-2004 Ithaca, NY, USA

PEER-REVIEWED PUBLICATIONS

TOTAL CITATIONS: **1108;** *H-INDEX*: **17**

** indicates HWS student co-author;

Hao, Y. and **Graham D. J.** 2020. Creative destruction: Sparse activity emerges on the mammal connectome under a simulated communication strategy with collisions and redundancy. *Network Neuroscience* 4 (4), 1055-1091. DOI: 10.1162/netn_a_00165

Daniel J. Graham, Ph.D.

Graham D. J., Avena-Koenigsberger, A., and Misic, B. 2020. Editorial: Network Communication in the Brain. *Network Neuroscience* 4 (4), 976-979.

Graham, D. J. and Hao, Y. 2018. A selective diffusion model of brain network activity. *Proceedings of the Conference on Cognitive Computational Neuroscience*, 1195.

Graham, D. J. 2017. Building brains that communicate like machines. *Behavioral and Brain Sciences* e266. doi:10.1017/S0140525X17000152

Pugach, C.** Leder, H. and **Graham, D. J.** 2017. How stable are human aesthetic preferences across the lifespan? *Frontiers in Human Neuroscience* 11:289.

Graham, D. J., Schwarz, B., Chatterjee, A. and Leder, H. 2016. Preference for luminance histogram regularities in natural scenes. *Vision Research* 120, 11-21.

Pugach, C.**, Daley, E.**, Leder, H. & **Graham. D. J.** 2014. Aesthetic stability in development. *Proceedings of the International Association for Empirical Aesthetics Biennial Congress*, New York, NY. ISBN: 0-692-29396-5.

Graham, D. J. 2014. Routing in the brain. *Frontiers in Computational Neuroscience* 8:44.

Graham, D. J., Pallett, P. M., Meng, M. and Leder, H. 2014. Representation and aesthetics of the human face in portraiture. *Art & Perception* 2(1-2), 75-98.

Graham, D. J., Stockinger, S. and Leder, H. 2013. An island of stability: art images and natural scenes—but not natural faces—show consistent aesthetic response in Alzheimer's-related dementia. *Frontiers in Psychology* 4:107.

Graham, D. J. 2013. Integrating holism and reductionism in the science of art perception. *Behavioral and Brain Sciences* 36(2), 145-146.

Graham, D. J. 2011. Visual Perception: Lightness in a high dynamic range world. *Current Biology*, 21(22), R914-R916.

Graham, D. J. and Rockmore, D. N. 2011. The packet switching brain. *Journal of Cognitive Neuroscience*, 23(2), 267-276.

Graham, D. J. and Meng, M. 2011a. Altered spatial frequency content in paintings by artists with schizophrenia. *i-Perception* 2(1), 1-9.

Graham, D. J. and Meng, M. 2011b. Artistic representations: clues to efficient coding in human vision. *Visual Neuroscience*, 28, 371-379.

Graham, D. J., Hughes, J. M., Leder, H. and Rockmore, D. N. 2011. Statistics, vision and the analysis of artistic style. *Wiley Interdisciplinary Reviews--Computational Statistics*, doi: 10.1002/wics.197.

Hughes, J. M., **Graham, D. J.**, Jacobsen, C. R. and Rockmore, D. N. 2011. Comparing higher-order spatial statistics and perceptual judgments in the stylometric analysis of art. *Proceedings of EUSIPCO 2011 (European Signal Processing Conference)* 1244-1248.

Hughes, J. M., **Graham, D. J.** and Rockmore, D. N. 2010. Quantification of artistic style through sparse

coding analysis in the drawings of Pieter Bruegel the Elder. ***Proceedings of the National Academy of Sciences USA***, 107(4), 1279-1283.

Graham, D. J. and Redies, C. 2010. Statistical regularities in art: relations with visual coding and perception. ***Vision Research*** 50(16) 1503-1509.

Graham, D. J., Friedenberg, J. D., Rockmore, D. N. and Field, D. J. 2010. Mapping the similarity space of paintings: image statistics and visual perception. ***Visual Cognition*** 18(4), 559-573.

Graham, D. J., Friedenberg, J. D. and Rockmore, D. N. 2010. Preference for art: similarity, statistics, and selling price. ***Proceedings of SPIE: Human Vision and Electronic Imaging*** 7527, 75271A1.

Hughes, J. M., **Graham, D. J.** and Rockmore, D. J. 2010. Stylometrics of artwork: uses and limitations. ***Proceedings of SPIE: Computer Vision and Image Analysis of Art*** 7531, 75310C1.

Graham, D. J. 2009. Art statistics and visual processing: insights for picture coding. ***Proceedings of the Picture Coding Symposium*** (Chicago, IL).

Graham, D. J., Friedenberg, J. D. and Rockmore, D. N. 2009. Efficient visual system processing of spatial and luminance statistics in representational and non-representational art. ***Proceedings of SPIE: Human Vision and Electronic Imaging*** 7240, 72401N1.

Graham, D. J. and Field, D. J. 2008. Variations in intensity statistics for representational and abstract art, and for art from the eastern and western hemispheres. ***Perception*** 37(9), 1341-1352.

Graham, D. J. and Field, D. J. 2008. Global nonlinear compression of natural luminances in painted art. ***Proceedings of SPIE: Computer Image Analysis in the Study of Art***, 6810, 68100K1.

Graham, D. J. and Field, D. J. 2007. Statistical regularities of art images and natural scenes: Spectra, sparseness and nonlinearities. ***Spatial Vision***, 21(1-2), 149-164.

Graham, D. J., Chandler, D. M. and Field, D. J. 2006. Can the theory of "whitening" explain the center-surround properties of retinal ganglion cell receptive fields? ***Vision Research***, 46(18), 2901-2913.

Cuesta-Lopez, S., Peyrard, M. and **Graham, D. J.** 2005. Model for DNA hairpin denaturation. ***European Physical Journal E-Soft Matter***, 16(3), 235-246.

ARTICLES UNDER REVIEW

Graham, D. J., Why is neural connection weight a weak predictor of correlated neural activity? Biorxiv.

ARTICLES IN PREPARATION

Hao, Y., Hütt, M-T. and Graham, D. J., Message "age" in dynamic simulations of nonlinear brain network communication.

ARTICLES FOR GENERAL READERS AND BOOK REVIEWS

Graham, Daniel. "What Kinds of Cars Do the Administrators Drive? The questions you should really ask on college tours." *Slate*. The Slate Group. March 28, 2019.

Graham, D. J. 2004. In the Blink of an Eye. *American Paleontologist* 12, 13-17.

Daniel J. Graham, Ph.D.

BOOKS

Graham, D. J. 2021. <u>An Internet in Your Head</u>. New York: Columbia University Press. https://cup.columbia.edu/book/an-internet-in-your-head/9780231196048

BOOK CHAPTERS

Graham, D. J. and Silverstein, S. M. (in preparation). Aesthetics and art-making in schizophrenia. In: A. Richard, M. Pelowski and B. Spee (Eds.), ***Art and Neurodegenerative Disease: Illuminating the Intersection of Illness and Creativity***, SpringerNature.

Graham, D. J. 2020. The use of visual statistical features in empirical aesthetics. In: M. Nadal and O. Vartanian (Eds.), ***Oxford Handbook of Empirical Aesthetics***, Oxford University Press, UK. DOI: 10.1093/oxfordhb/9780198824350.013.19

Graham, D. J. and Field, D. J. 2009. Natural Images: Coding Efficiency. In: L. R. Squire (Ed.) ***Encyclopedia of Neuroscience*** Vol. VI (pp. 19-27). Oxford: Academic Press.

Graham, D. J. and Field, D. J. 2006. Sparse coding in the neocortex. In ***Evolution of Nervous Systems***, Vol. III (pp. 181-187), J. Kaas, L. Krubitzer eds. Oxford: Academic Press.

THESES

Graham, D. J. 2008. The relationship between efficient coding of natural scenes in the human visual system and statistical regularities in art. Doctoral Dissertation, Department of Psychology, Cornell University.

Graham, D. J. 2004. Efficient retinal ganglion cell coding and the statistics of natural scenes. Master's Thesis, Department of Physics, Cornell University.

GRANT SUPPORT AND AWARDS

Daniel J. Graham, Ph.D.

** indicates HWS student co-author

Graham, D. J. and Hao, Y. (2019, September). Nonlinear collision rules on the mammal connectome produce different behavior in diffusion processes compared to random walk models. Bernstein Conference on Computational Neuroscience, Berlin, DE.

Graham, D. J. and Hao, Y. (2018, September). A selective diffusion model of brain network activity. Conference on Cognitive Computational Neuroscience, Philadelphia, PA.

Graham, D. J. (2018, August). Human preference for the "true" entropy in visual displays. International Association for Empirical Aesthetics Biennial Congress, Toronto, ON, CA.

Graham, D. J. and Hao, Y. (2018, July). Sparseness and message loss in simulated packet-switching primate brain networks. Federation of European Neuroscience Societies Forum, Berlin, DE.

Hao, Y. and **Graham, D. J.** (2018, June). Simulating efficient routing protocols in primate brain networks. International Conference of Mathematical Neuroscience, Juan-les-Pins, FR.

Teceno, D.** and **Graham. D. J.** (2017, May). Aesthetic stability in adults with brain injury: A pilot study. Association for Psychological Science Conference, Boston, MA.

Graham, D. J. (2017, March). Human aesthetic stability. International Conference of Psychological Science, Vienna, Austria. [presenter and co-chair of symposium, *Art and Aesthetics in Everyday Life*].

Prescott, N.** and **Graham, D. J.** (2017, March). The visual neuroscience of masks. Eastern Psychological Association, Boston, MA.

Forman, C.**, Pallett, P., Leder, H. and **Graham, D. J.** (2016, May). Face representation in human mask-making. Association for Psychological Science, Chicago, IL.

Graham, D. J. (2016, April). Face representation in portraiture and mask-making. Invited Panelist, American Society for Aesthetics, Eastern Section Annual Conference, Philadelphia, PA.

Pugach, C.**, Daley, E.**, Leder, H. and **Graham, D. J.** (2014, August). Aesthetic Stability in Development. International Association for Empirical Aesthetics Biennial Congress, New York, NY.

Graham, D. J., Schwarz, B., and Leder, H. (2013, May). Preference for higher-order luminance regularities in natural scenes. Vision Sciences Society, Naples, FL.

Graham, D. J. and Meng, M. (2011, May). Lightness constancy in visual artists. Vision Sciences Society, Naples, FL.

Hughes, J. M., **Graham, D. J.**, Jacobsen, C. R. and Rockmore, D. N. (2011, August). Higher-order Spatial Statistics and Perceptual Judgments in the Stylometric Analysis of Art. EUSIPCO 2011 (19th European Signal Processing Conference), Barcelona, ESP.

Graham, D. J. and Meng, M. (2010, November). Rapid classification of paintings: Evidence for efficient artistic representations. Psychonomic Society, St. Louis, MO.

Graham, D. J. and Meng, M. (2010, August). Altered spatial frequency content in paintings by artists with schizophrenia. Talk presented at the European Conference on Visual Perception, Lausanne, SWITZERLAND.

Graham, D. J., Friedenberg, J. D. and Rockmore, D. N. (2010, January). Preference for art: similarity, statistics, and selling price. Talk presented at the SPIE Electronic Imaging Conference on Human Vision and Electronic Imaging, San Jose, CA.

Hughes, J. M., **Graham, D. J.** and Rockmore, D. J. (2010, January) Stylometrics of artwork: uses and

limitations. Talk presented at the <u>SPIE Electronic Imaging Conference on Computer Image Analysis in the Study of Art</u>, San Jose, CA.

Graham, D. J., Friedenberg, J. D. and Rockmore, D. N. (2009, August). Mathematics, perception, and the visual arts: new perspectives. Talk presented at <u>Society for Mathematical Psychology</u>, Amsterdam, NETHERLANDS.

Graham, D. J., Friedenberg, J. D. and Rockmore, D. N. (2009, July). The efficiency of visual artwork: relating cognitive and perceptual processing to nonlinear image statistics. Poster presented at the <u>Cognitive Science Society</u>, Amsterdam, NL.

Graham, D. J. (2009, May). Art statistics and visual processing: insights for picture coding. Invited panelist at the <u>Picture Coding Symposium</u>, Chicago, IL.

Graham, D. J., Friedenberg, J. D. and Rockmore, D. N. (2009, January). Intensity statistics of artwork: connections to human visual perception. Talk presented at the <u>SPIE Electronic Imaging Conference on Human Vision and Electronic Imaging</u>, San Jose, CA.

Graham, D. J., Friedenberg, J. D., Rockmore, D. N. and Field, D. J. (2008, August). Mapping the similarity space of paintings: Is there a role for image statistics? Talk presented at the <u>European Conference on Visual Perception</u>, Utrecht, NETHERLANDS.

Graham, D. J. and Field, D. J. (2008, January). Global nonlinear compression of natural luminances in painted art. Talk presented at the <u>SPIE Electronic Imaging Conference on Computer Image Analysis in the Study of Art</u>, San Jose CA.

Cutting, J. E., **Graham, D. J.** and Field, D. J. (2008, February). From a neuroesthetics to a neuroarthistory. <u>College Art Association</u>, Dallas TX.

Graham, D. J., Page, K. B. and Field, D. J. (2006, August). Relating nonlinearities to statistical regularities in paintings. Talk presented at the <u>European Conference on Visual Perception</u>, St. Petersburg, RUSSIA.

Graham, D. J., Chandler, D. M. and Field, D. J. (2005, August). How alike are natural scenes and paintings? Characterizing the spatial statistical properties of a set of digitized, grey-scale images of painted art. <u>European Conference on Visual Perception</u>, La Coruna, Spain.

Graham, D. J., Chandler, D. M. and Field, D. J. (2004, May). Decorrelation and response equalization with center-surround receptive fields. <u>Vision Sciences Society</u>, Sarasota, FL.

EDITORIAL DUTIES

Editorial Board, *Art & Perception*
Guest Editor, "Focus Feature: Network Communication in the Brain," *Network Neuroscience*
Guest Associate Editor, *Frontiers in Human Neuroscience*

PEER REVIEW DUTIES

American Journal of Psychology; Behavioral and Brain Sciences; Brain and Cognition; Color Research and Application; Current Biology; Deutsche Forschungsgemeinschaft; *Frontiers in Digital Humanities; Frontiers in Human Neuroscience;* Flanders Research Foundation*; i-Perception; Journal of Experimental Psychology: General; Journal of Experimental Psychology: Human Perception and Performance; Journal of the Optical Society of America A; Leonardo;* National Science Foundation CISE Program*; Network Neuroscience; PeerJ; Perception; Perspectives on Psychological Science; Physica A: Statistical Mechanics and its Applications; PLoS ONE; PLoS Computational Biology; Psychological Science; Psychology of Aesthetics, Creativity, and the Arts; Seeing and Perceiving; Signal Processing; Journal of Undergraduate Neuroscience Education; Vision Research.*

Daniel J. Graham, Ph.D.

PROFESSIONAL AFFILIATIONS

Fellow, *Psychonomic Society*

Associate Member, *Behavioral and Brain Sciences* Journal

Member, *Vision Sciences Society*

Member, *International Association for Empirical Aesthetics*

INVITED LECTURES (SELECTED)

Fitchburg Art Museum,
> Fitchburg MA USA, May 17, 2017.

Eastern American Society for Aesthetics
> Philadelphia, PA, April 17, 2016.

Department of Psychology,
> Cornell University, Ithaca, NY, USA, November 5, 2012

Department of Psychological Basic Research,
> University of Vienna, AUSTRIA, May 29, 2012.

Department of Psychological Basic Research,
> University of Vienna, AUSTRIA, June 1, 2011.

Laboratory of Computational Neuroscience,
> Ecole Polytechnique Federale de Lausanne, SWITZERLAND, August 25, 2010.

Department of Psychological and Brain Sciences,
> Dartmouth College, Hanover, NH, USA, March 4, 2010.

Redwood Neuroscience Institute,
> University of California, Berkeley, CA, USA, November 18, 2009.

School of Optometry,
> University of California, Berkeley, CA, USA, November 20, 2009.

Department of Mathematics,
> Middlebury College, VT, USA, September 16, 2009.

Van Gogh Museum,
> Amsterdam, NETHERLANDS, October 21, 2008.

School of Medicine,
> Friedrich-Schiller-University, Jena, GERMANY, September 2, 2008.

Department of Mathematics,
> Dartmouth College, Hanover, NH, USA, May 27, 2008.

Herbert F. Johnson Museum of Art,
> Cornell University, April 18, 2007.

OTHER RESEARCH ACTIVITIES

Scientific Consultant, Knights of Columbus, 2013. Project titled: "Music and the Image of Our Lady of Guadalupe."

Lead Researcher of Scientific Content for mass market book about using email effectively: *Send*, by Will Schwalbe and David Shipley (Knopf, 2006)

Daniel J. Graham, Ph.D.

Hobart and William Smith Colleges

Instructor (in-person), 2012-current

Psychology 100 *Introduction to Psychology*

Psychology 299 *Sensation and Perception*

Psychology 309 *Topics in Sensation and Perception*

Psychology 310 *Research in Sensation and Perception*

Psychology 398 *Advanced Theory and Design in Sensation and Perception*

Psychology 498 *Capstone Research in Sensation and Perception*

Fully Remote Instruction, 2020-current

Psychology 299 *Sensation and Perception* (regular semester and accelerated summer semester)

Psychology 398 *Advanced Theory and Design in Sensation and Perception*

Psychology 498 *Capstone Research in Sensation and Perception*

Courses prepared but not taught

Psychology 201/202 *Statistics and Design*

Psychology 230 *Biopsychology*

Psychology 231 *Cognitive Psychology*

Psychology 235 *Cognitive Neuroscience*

Psychology 314 *Advanced Theory and Design in Behavioral Neuroscience*

Psychology 414 *Capstone Research in Behavioral Neuroscience*

Evolutionary Psychology

Introduction to Neuroscience

Advisor, Honors Thesis

Eleanor Cherry, 2017-2018

Arianna White, 2012-2013

Academic advisor: 64 majors, 13 minors

University of Vienna

Instructor, 2011, 2012 & 2015

Psychology 200022 *Introductory Seminar: Cognitive Foundations of Experience and Behavior*

Psychology 200097 *Research Seminar on Cognitive Psychology and Neuroscience*

Advisor, Diploma (Master's-level) Thesis

Eva Karesch: Statistics of Facial Attractiveness, 2011

Simone Stockinger: Aesthetic Stability in Alzheimer's related Dementia, 2011

Franziska Schiller: Theories of Animal Camouflage. 2011

Maria Noisternig: Luminance Scaling in Representational Artwork, 2011

Bianca Schwarz: Luminance Statistics and Evolutionary Aesthetics, 2012

Dartmouth College

Instructor, 2009-2011

Mathematics 126 *Current Topics in Applied Mathematics: Mathematical Methods and Models in Visual Neuroscience*

Middlebury College

Thesis Reader (external)

Anna Rosenblatt: *Visual Processing: Optimizing a Basis,* 2010, Department of Physics.

Cornell University

Teaching Assistant, 2004-2007

Psychology 2050 *Perception*

Psychology 3420 *Human Perception: Applications to Computer Graphics, Art, and Visual Display*

INSTITUTIONAL SERVICE AND LEADERSHIP (SELECTED)

Hobart And William Smith Colleges

BIPOC in STEM Mentor

Neuroscience Liaison

Health Professions Advisory Committee, 2015-current

Individual Major Committee, 2017-18, 2020-2021

Science Building Planning Committee, Psychology Liaison, 2017-2018

Faculty Research and Honors Committee, 2015-2016

Colloquium Organizer, Department of Psychology, 2013-current

Faculty Hiring Committee, Department of Psychology, 2015-2018

Tenure Review Committee, Department of Psychology, 2014-2018, 2020-2021

Curriculum Review Committee, Department of Psychology, 2016

Human subjects research administrator, Department of Psychology, 2015-current

Holland Prize Committee, 2015-2019

OTHER SKILLS

Languages: Conversational French and German

Computing: Matlab (image processing, signal analysis, advanced statistics, network structure and dynamics); PsychToolBox (stimulus generation/presentation, experiment design); Photoshop; Audacity; FantaMorph; Mathematica; R; Fortran 77; HTML; LaTeX; Praat; PeopleSoft; Canvas; Moodle

Daniel J. Graham, Ph.D.

Experimental Apparatus: Eye-tracking (CRS and Mirametrix); basic invertebrate extracellular electrophysiology; colorimetry/radiometry