

ELENA I. RYKHLEVSKAIA, PhD

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EDUCATION

- 2006 Ph.D. in Quantitative Psychology with minor in Brain and Cognition, University of Illinois at Urbana-Champaign.
Dissertation: Anatomically informed models of functional connectivity in the brain.
- 2002-2004 M.S. in Applied Statistics with specialization in Psychometrics and Behavioral Statistics, University of Illinois at Urbana-Champaign.
- 1999-2001 M.S. equivalent in Computer Science, Lomonosov Moscow State University.
- 1996-2001 Diploma (with honors) in Industrial/Organizational Psychology, Lomonosov Moscow State University, Russia.
Thesis: A method for scaling nonverbal stimuli on the Internet: technological problems and future prospects.

RESEARCH INTERESTS

- Structural and functional neuroimaging (optical imaging, functional magnetic resonance imaging, diffusion tensor imaging); multimodal integration of neuroimaging data;
- Individual differences in anatomical, functional and effective connectivity in developing and aging brain;
- Statistical inference and modeling; latent variable modeling, multivariate analysis;
- Psychological test theory and psychometrics;

AWARDS AND HONORS

- 2007 Bio-X Postdoctoral Fellowship, Stanford University (1 year stipend)
- 2006 Nancy Hirschberg Memorial Award for Outstanding Research, Psychology Department, University of Illinois at Urbana-Champaign.
- 2005 Beckman Institute Graduate Fellowship (1 year stipend)
- 2004 Student Travel Award, 37th Annual Meeting of the Society for Mathematical Psychology.
- 2003 Student Poster Award, 43rd Annual Meeting of the Society for Psychophysiological Research.
- 2001 Top List of College Graduates in Moscow and Moscow Area, 2001.
- 2001 Diploma Thesis Prize: "In recognition of the significant contribution to methodological development of psychological sciences", Psychology Department, Lomonosov Moscow State University.
- 2000 Moscow City Mayor Fellowship.
- 1999 and 2000 Laureate of Annual Lomonosov International Conferences for Students in Fundamental Sciences, Section "Psychology", Moscow, Russia.
- 1999 Laureate of International Conference for Students "Psychology of XXI Century", St. Petersburg, Russia.

RESEARCH EXPERIENCE

2007-current **Postdoctoral Fellow**

Cognitive and Systems Neuroscience Lab, Stanford University.

Principal Investigator: Prof. Vinod Menon, Department of Psychiatry and Behavioral Sciences.

Projects:

- Structural brain connectivity deficits in children with math disability.
- Automated identification of intrinsic brain networks from resting state functional fMRI.

Vision Imaging Science and Technology Lab, Psychology Department, Stanford University.

Principal Investigator: Prof. Brian Wandell, Department of Psychology

Project:

- Measuring the development of white matter in the brain using diffusion tensor imaging.

Functional Imaging in Neuropsychiatric Disorders Lab, Stanford University.

Principal Investigator: Prof. Michael Greicius, Department of Neurology and Neurological Sciences.

Project:

- Imaging healthy aging in the brain .

2007 **Research Consultant**

Language in the Aging Brain Lab, Boston University.

Principal Investigators: Prof. Loraine Obler and Prof. Martin Albert, Boston VA Healthcare System and Boston University School of Medicine.

Project:

- Brain changes associated with age-related decline in naming: analysis of structural MRI and diffusion tensor imaging data.

2002 -07 **Research Assistant**

Cognitive Neuroimaging Lab, Beckman Institute, University of Illinois at Urbana-Champaign.

Research Advisors: Prof. Gabriele Gratton and Prof. Monica Fabiani, Dept. of Psychology

Projects:

- Age-related changes in frontal and parietal interhemispheric connectivity revealed by diffusion tensor imaging
- Cross-correlational analysis, dynamic factor analysis, structural equation modeling and other multivariate techniques for analysis of brain functional connectivity using optical imaging data.
- Anatomical correlates of aging and cardiopulmonary fitness level: a voxel-based morphometry study.

RESEARCH EXPERIENCE (cont'd)

2002 **Research Assistant**

Department of Psychology, University of Illinois at Urbana-Champaign.

Research Advisor: Prof. Michael Regenwetter.

Projects:

- Scoring rules: empirical data analysis of model dependence.
- Generalized rankings associated with any finite binary relation.

1999 -01 **Research Assistant**

Computer Psychological Diagnostics Lab, Lomonosov Moscow State University.

Research Advisor: Prof. Shmelyov, Psychology Department.

Selected Projects:

- Career guiding website for high school students: content and web development. URL: <http://ht.ru/prof> (in Russian).
- Computer-based test of occupation-related abilities, interests and personality constructs “Proforientator”: development and data analysis.
- “Russian Big Five” questionnaire - psychometrical adaptation of online administered version: validity and reliability analysis.

TEACHING EXPERIENCE

Fall Teaching Assistant, University of Illinois at Urbana-Champaign.
2002 Laboratory in Psychological Measurement and Test Development,
graduate course.

Teaching Supervisor: Prof. McDonald.

Fall Teaching Assistant, University of Illinois at Urbana-Champaign.
2001 Introduction to Statistics, undergraduate course.

Teaching Supervisor: Prof. Hubert.

ADDITIONAL PROFESSIONAL TRAINING

August Training Course in Functional Magnetic Resonance Imaging (fMRI).
2007 University of Michigan. Ann Arbor, MI.

March Short Course on Bayesian Modeling, Inference and Prediction.
2005 American Statistical Association. Chicago, IL.

July Graduate Summer School: Mathematics in Brain Imaging. Institute
2004 for Pure and Applied Mathematics, UCLA. Los Angeles, CA.

July The fMRI Data Center Summer Workshop in fMRI Informatics.
2004 Dartmouth College. Hanover, NH.

June Notre Dame Series on Quantitative Methodology Conference and
2004 Workshop. Models of Cognitive Aging. University of Notre Dame.
Notre Dame, IL.

August Advanced Training Institute in Social Psychology Experiments via
2002 the WWW. Department of Psychology, California State University.
Fullerton, CA.

REFEREED JOURNAL ARTICLES

- Rykhlevskaia, E.**, Uddin, L. Q., Kondos, L., Menon, V. *Neuroanatomical correlates of developmental dyscalculia: Combined evidence from morphometry and tractography*. Under review in *Frontiers in Human Neuroscience*.
- Uddin, L. Q., Supekar, K., Amin, H., **Rykhlevskaia, E.**, Nguyen, D.A., Greicius, M.D., Menon, V. *Dissociable connectivity within human angular gyrus and intraparietal sulcus: Evidence from functional and structural connectivity*. Under review in *Cerebral Cortex*.
- Thomason, M. E., Dougherty, R.F., Colich, N.L., Perry, L.M., **Rykhlevskaia, E.I.**, Louro, H.M., Hallmayer, J.F., Waugh, C.E., Bammer, R., Glover, G.H., Gotlib, I.H. *COMT genotype affects prefrontal white matter pathways in children*. Under review in *Frontiers in Human Neuroscience*.
- Obler, L.K., **Rykhlevskaia, E.I.**, Schnyer, D., Clark-Cotton, M.R., Hyun, J.M., Kim, D-S., Spiro, A., Goral, M., Albert, M. *Bilateral Brain Regions Associated with Naming in Older Adults*. Under review in *Brain and Language*.
- Gratton, G., Wee, E., **Rykhlevskaia, E.**, Leaver, E., Fabiani, M. (2009). Does white matter matter? Spatiotemporal dynamics of task switching in aging. *Journal of Cognitive Neuroscience*, 21(7): 1380-1395.
- Gordon, B., **Rykhlevskaia, E.**, Brumback, C., Lee, Y., Elavsky, S., Konopack, J., McAuley, E., Kramer, A., Colcombe, S., Gratton, G., Fabiani, M. (2008). *Neuroanatomical correlates of aging, cardiopulmonary fitness level, and education*. *Psychophysiology*, 45(5): 825-838.
- Ombao, H., Shao, X., **Rykhlevskaia, E.**, Fabiani, M. and Gratton, G. (2008). *Spatio-Spectral Analysis of Brain Signals*. *Statistica Sinica*, 18(4).
- Rykhlevskaia, E.**, Gratton, G., Fabiani, M. (2008). *Combining structural and functional neuroimaging data for studying brain connectivity: A review*. *Psychophysiology*, 45, 173-182.
- Regenwetter M., **Rykhlevskaia, E.** (2007) *A general concept of scoring rules: General definitions, statistical inference, and empirical illustrations*, *Social Choice Welfare*, 29: 211-228.
- Rykhlevskaia, E.**, Fabiani, M., Gratton, G. (2006). *Lagged covariance structure models for studying functional connectivity in the brain*. *NeuroImage*, 30: 1203-1218.
- Regenwetter, M., **Rykhlevskaia, E.** (2004). *On the (numerical) ranking associated with any finite binary relation*. *Journal of Mathematical Psychology*, 48: 239-246.
- Rykhlevskaia, E.** (2002). *A method for scaling nonverbal stimuli on the Internet: technological problems and future prospects*. *Vestnik Moskovskogo Universiteta*, ser. 14, *Psikhologiya*, 1: 104-105 (in Russian).

PUBLISHED ABSTRACTS AND CONFERENCE PRESENTATION

- Obler, L.K., Rykhlevskaia, E., Clark-Cotton, M.R., Schnyer, D., Hyun, J.M., Kim, D-S., Spiro, A., Goral, M., Albert, M.L. (2009). *Brain regions associated with age-related decline in naming*. First Neurobiology of Language Conference, Chicago.
- Rykhlevskaia, E.I., Sherbondy, A., Wandell, B.A., Dougherty, R.F. (2009). *Differential growth of major white matter tracts in healthy children: a longitudinal study using DTI tractography*. *Neuroimage* 47 (S1).
- Rykhlevskaia, E.I., Uddin, L.Q., Kondos, L., Menon, V. (2009). *Structural Brain Connectivity Deficits in Young Children with Math Disability*. *Neuroimage* 47 (S1).

- Devarajan, S., **Rykhlevskaia, E.**, Supekar, K., Chang, C., Greicius, M., Menon, V. (2008). *Algorithm for automated identification of intrinsic brain networks on group studies by clustering independent components across subjects*. *Neuroimage* 41 (S1).
- Rykhlevskaia, E.**, Clark-Cotton, M., Spiro III, A., Obler, L., Albert, M. (2008). *White matter correlates of lexical retrieval in elderly adults*. *Neuroimage* 41, Supplement 1.
- Rykhlevskaia, E.** (2007). *Incorporating anatomical connectivity into models of functional connectivity*. *Neuroimage* 36 (S1).
- Gratton, G., Fabiani, M., & **Rykhlevskaia, E.** (2007). *Functional connectivity based on fast non-invasive optical imaging data*. Sixths International workshop on brain connectivity, Barcelona, Spain.
- Gordon, B. A., **Rykhlevskaia, E. I.**, Brumback, C. R., McAuley, E., Kramer, A. F., Colcombe, S., Gratton, G., & Fabiani, M. (2007). *The effects of education and physical fitness on brain anatomy*. *Psychophysiology*, 44 (Suppl. 1), S54-S55.
- Rykhlevskaia, E.**, Fabiani, M., Gratton, G. (2006). *Age-related changes in frontal and parietal interhemispheric connectivity revealed by diffusion tensor imaging*. *Psychophysiology*, 43 (S1).
- Gordon, B. A., Schneider, N. J., Brumback, C. R., **Rykhlevskaia, E. I.**, Scalf, P., Doerksen, S. E., Morris, K. S., McAuley, E., Gratton, G., & Fabiani, M. (2006). *The effects of cardiovascular fitness in older adults on a Sternberg memory search paradigm: An fMRI study*. *Psychophysiology*, 43 (S1).
- Rykhlevskaia, E.**, Gordon, B., Brumback, C., Gratton, G., Fabiani, M. (2006). *Anatomically informed models of effective connectivity in the brain*. *Neuroimage* 31, (S1).
- Whalen, C., Maclin, E., **Rykhlevskaia, E.**, Fabiani, M., Gratton, G. (2006). *Aligning Functional Surface Brain Recordings with Anatomical MRI: minimizing registration errors*. *Neuroimage* 31 (S1).
- Leaver, E., **Rykhlevskaia, E.**, Wee, E., Fabiani, M., Gratton, G. *Corpus callosum size mediates age-related changes in working memory function*. (2006). *National Institute of Mental Health Division of Intramural Research Programs Pre-doctoral Research Festival*.
- Leaver, E., **Rykhlevskaia, E.**, Wee, E., Gratton, G., & Fabiani, M. (2006). *Age-related changes in brain activity in a working memory task are mediated by corpus callosum size*. Cognitive Aging Conference, Atlanta, GA.
- Rykhlevskaia, E.**, Gordon, B., Brumback, C., Gratton, G., Fabiani, M. (2006). *A method for incorporating diffusion tensor imaging into models of effective connectivity*. *Journal of Cognitive Neuroscience Supplement*.
- Whalen, C., Maclin, E., **Rykhlevskaia, E.**, Fabiani, M., Gratton, G. (2006). *Combining functional and anatomical data: improving methods of coregistration*. *Journal of Cognitive Neuroscience Supplement*.
- Rykhlevskaia, E.**, Wee, E., Fabiani, M., Gratton, G. (2005). *A statistical methodology: analysis of lagged correlations for studying functional connectivity in brain*. *Journal of Cognitive Neuroscience Supplement*, 33.
- Gordon, B., **Rykhlevskaia, E.**, Colcombe, S., Gratton, G., Fabiani, M. (2005). *A voxel-based morphometry (VBM) analysis of brain anatomical differences due to age and fitness*. *Journal of Cognitive Neuroscience Supplement*, 44.
- Fabiani, M., **Rykhlevskaia, E.**, Wee, E., Leaver, E., & Gratton, G. (2004). *Brain imaging measures of age-related changes in inhibitory function*. *Cognitive Aging Conference Proceedings*.
- Rykhlevskaia, E.**, Wee, E., Leaver, E., Gratton, G., Fabiani, M. (2004). *Anterior corpus callosum size predicts task-switching cost and associated inter-hemispherical functional connectivity patterns*. *Journal of Cognitive Neuroscience Supplement*, 16.

- Rykhlevskaia, E.**, Regenwetter, M. (2004). *A general class of positional voting methods: theory and empirical analysis*. 37th Annual Meeting of the Society for Mathematical Psychology, Ann Arbor, MI.
- Rykhlevskaia, E.**, Regenwetter, M. (2004). *A statistical analysis of positional voting methods*. Proceedings of the International Conference "Mathematical modeling of social and economical dynamics", Moscow, Russia.
- Rykhlevskaia, E.**, Wee, E., Fabiani, M., Gratton, G. (2004). *Path analysis for modeling fast changes in connectivity*. *Psychophysiology*, 41, S54.
- Rykhlevskaia, E.**, Wee, E., Fabiani, M., Gratton, G. (2004). *Structural equation modeling of fast changes in connectivity*. The Frontiers of Biomedical Imaging Symposium: "The MRI Nobel Celebration and Future Directions", Urbana-Champaign, IL.
- Wee, E., **Rykhlevskaia, E.**, Leaver, E., Rowley, T., Gratton, G., Fabiani, M. (2004). *Corpus Callosum size (not age) mediates congruency effect*. *Psychophysiology*, 41, S53.
- Rykhlevskaia, E.**, Wee, E., Leaver, E., Fabiani, M., Gratton, G. (2003). *Studying functional connectivity in the brain with cross-correlational analysis of optical imaging data*. *Psychophysiology*, 40, S73.
- Rykhlevskaia E.**, Regenwetter M. (2002). *On a general concept of scoring rules: model and empirical data analysis*. 35th Annual Meeting of the Society for Mathematical Psychology. Oxford, OH.
- Rykhlevskaia, E.** (2001). *The dynamics of teenager's interests and abilities related to their occupational choice*. Lomonosov International Conference for Students in Fundamental Sciences. Moscow, Russia.
- Larionov A.G., **Rykhlevskaia E.**, Lebedeva A.V. (2000). *Projective methods of studying a politician's image: a psychogeometrical approach*. International Conference for Students "Psychology of XXI Century". St. Petersburg, Russia.
- Rykhlevskaia E.** (2000). *Personalized psychosemantics of type-face in self-presentation*. Lomonosov International Conference for Students in Fundamental Sciences. Moscow, Russia.
- Shmelyov A.G., **Rykhlevskaia, E.**, Larionov A.G. (2000). *A study of Internet-mediated communication*. Proceedings of the II Russian Conference in Ecological Psychology. Moscow, Russia.
- Rykhlevskaia, E.** (1999). *Personal image: olfactory modality in the interpersonal perception*. Lomonosov International Conference for Students in Fundamental Sciences. Moscow, Russia.
- Rykhlevskaia, E.** (1999). *Studying olfactory modality in the interpersonal perception*. International Conference for Students "Psychology of XXI Century". St. Petersburg, Russia.

INVITED TALKS

- Invited speaker ("Job Talk") at Yale University, Stanford University, University of Missouri, Massachusetts Institute of Technology, Martinos Center for Biomedical Imaging, New York University, 2007.
- Measuring Structural Connectivity in the Brain: Methods and Applications*. Beckman Institute Student Seminar. Champaign, IL, 2006.
- Lagged covariance structure models for studying functional connectivity in the brain*. Human/Computer Vision Symposium. Champaign, IL, 2005

PROFESSIONAL SERVICE

Journal referee for American Journal of Psychiatry, NeuroImage, Neural Networks, 2006-2009

Member of the SPR Committee to Promote Student Interests, 2005-2007
(Postdoctoral “Student” Subcommittee)

Organizing Committee Member for “Advances in Resting-State fMRI” symposium, satellite of Human Brain Mapping 2009, Stanford, CA.

PROFESSIONAL SKILLS

Programming	Matlab, C++, CSS, Java Script, HTML, PHP, MySQL, C Shell/Bash.
Applications	Afni, FSL, SPM, E-Prime, Mathematica, R, SAS, SPSS, STATISTICA.
MRI data collection	3 T G.E. Healthcare whole-body MR system