Eleanna Varangis

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EDUCATION

University of North Carolina - Chapel Hill, Chapel Hill, NC
Doctor of Philosophy in Cognitive Psychology and Neuroscience *December 2017*
Dissertation: Persistent Neurocognitive Effects of Concussion in Middle-Adulthood
Quantitative Psychology Concentration
Master of Arts in Psychology *May 2015*
Masters Thesis: Does Genotype Moderate the Effects of Concussion History and Contact Exposure on Working Memory Processes in Retired Football Players?
UNC-CH Imaging Association Founding Board Member
Advisors: Kelly Giovanello & Kevin Guskiewicz

Barnard College, Columbia University, New York, NY **May 2010**
Bachelor of Arts double-major in Psychology and Economics
Dean's List (2008-2010)

FELLOWSHIPS

NIH F31 Ruth L. Kirschstein Predoctoral Individual National Research Service Award **Jan. - Oct. 2017**
Title: Persistent Neurocognitive Effects of Concussion in Middle-Adulthood
UNC-Chapel Hill Future Faculty Fellow **Jan. - May 2016**

AWARDS

Cognitive Neuroscience Society Post-Doctoral Fellow Award **Mar. 2021**
Poster Title: Cognitive Correlates of Longitudinal Change in Functional Connectivity – Evidence from an Adult Lifespan Sample
Rudel Prize for Neuropsychology Research **Apr. 2019**
Title: Functional Neuroimaging Biomarkers of Memory Decline and Neuropathology in Aging
Dallas Aging and Cognition Conference Sallie P. Asche Travel Award **Jan. 2019**
Poster Title: Between-Network Functional Connectivity is Modified by Age and Cognitive Task Domain
Baughman Dissertation Research Award **May 2016**
Title: Persistent Neurocognitive Effects of Concussion in Middle-Adulthood

ACADEMIC POSITIONS

University of Michigan, School of Kinesiology Ann Arbor, MI **Aug 2022 - Present**
Assistant Professor of Movement Science

RESEARCH EXPERIENCE

Columbia University, Neurology Department New York, NY **Nov 2017 - Aug 2022**
Post-doctoral Research Scientist
Advisor: Dr. Yaakov Stern
Primary Focus: Analysis of relationships among age, functional connectivity, and cognitive performance throughout the adult lifespan

- First project involved utilizing a latent factor approach to modeling connectivity among cognitive networks during performance of 11 cognitive tasks reflecting 4 primary cognitive domains (vocabulary or semantic memory, processing speed or attention, fluid reasoning, and episodic memory)

- Second project examined the effect of age on a variety of standard metrics of resting-state connectivity, as well as relationships between these metrics and performance on a battery of neuropsychological tasks
- Third project utilized the same standard functional connectivity metrics employed in the second project in order to explore how task domain affected the age-related connectivity patterns observed at rest
- Current project aims to test whether longitudinal change in functional connectivity is related to change in cognitive performance over a 5-year period, and whether age affects the presence and magnitude of this relationship

UNC-CH, Psychology & Neuroscience Department Chapel Hill, NC **Aug 2012 - Oct 2017**

Doctoral Dissertation

Committee Members: Drs. Kelly Giovanello, Kevin Guskiewicz, Neil Mulligan, Kathleen Gates, & Jessica Cohen

- Parent project was a 15-year follow-up study of former NCAA athletes (PI: Guskiewicz)
  - Former NCAA athletes who participated in Division I athletics between 1999-2001 (age 35-45)
  - Dissertation study included 40 participants: former NCAA football players with 4+ concussions (n=21), former NCAA football players with 0-1 concussions (n=14), and former NCAA non-contact athletes with 0-1 concussions (n=5)
  - Dissertation study involved fMRI data collected during encoding of a novel paired associate learning paradigm developed by Dr. Varangis
  - Analyses included examination of fMRI task-based functional connectivity data, DTI data, in-scanner task data, and neuropsychological task data
- Analysis of in-scanner task and neuropsychological task data showed no effect of concussion history or football exposure on performance
- Analysis of DTI data showed no effect of concussion history or football exposure on white matter integrity (assessed via both tract-based spatial statistics and tractography)
- Analysis of functional connectivity data showed an effect of concussion history, such that individuals with a history of 4+ concussions showed greater intrusion of a task-irrelevant network on a task-relevant network during the task

Master's Thesis

Committee Members: Drs. Kelly Giovanello, Kevin Guskiewicz, & Joseph Hopfinger

- Secondary analysis of data from first-year project (see below)
- Connectivity analysis of fMRI data and analysis of neuropsychological task performance
- Participants stratified based on football career duration (college-only vs. 5+ years in the NFL), concussion history (0-1 concussions vs 3+ concussions), and genotype (APOE-ε4+ vs. APOE-ε4-)
  - Neuropsychological task results suggested that there were no significant differences in task performance across multiple cognitive domains (attention, language, working memory, explicit memory) based on any of the above grouping variables
  - Connectivity results suggested that genotype significantly interacted with both concussion history and career duration in predicting ROI-based connectivity within a fronto-temporal working memory network

First Year Project

- Collaborative project with Drs. Giovanello and Guskiewicz
  - 63-participant study including task-based fMRI (n-back working memory task) and neuropsychological measures
  - Participants recruited based on football career duration (college-only vs. 5+ years in the NFL) and concussion history (0-1 concussions vs 3+ concussions)
- Behavioral results from the working memory task completed in the scanner suggested that there were no differences in working memory task performance based on football career duration or concussion history
- fMRI results suggested that participants with a history of multiple concussions show significant and widespread functional activation differences compared to participants with no history of multiple concussions, while career duration accounted for considerably fewer activation differences

Mount Sinai School of Medicine, Psychiatry Department New York, NY **Jan 2010 - Jul 2012**

Clinical Research Coordinator, Eating and Weight Disorders Program, Program for Appearance and Performance Enhancing Drug Use Research

Mentor: Dr. Thomas Hildebrandt

- Coordinator for ongoing research studies

- NIDA-funded K23 study on neurocognitive effects of anabolic steroid use in adult males involving 9 visits over the course of 6-8 months
- Pilot fMRI study of emotional regulation for women with bulimia nervosa with and without borderline personality disorder
- Treatment study comparing mirror exposure vs. non-directive therapy for use in the treatment of body image concerns
- NIDA-funded R21 study utilizing PET imaging and the [11C]Vorozole ligand to examine aromatase activity in anabolic steroid users over the course of an anabolic steroid cycle

- Assisted in the submission of multiple grant applications (R01, R21, and R41 mechanisms)
- Responsible for maintaining databases and analyzing data for ongoing studies
- Trained in conducting various psychological interviews (SCID I-II, EDE, PEDE, YBC-ED, Y-BOCS, YMRS, K-SADS, APEDUS) and neuropsychological tests (WASI, Go/No-Go task, Affective Go/No-Go Task, SKIP Paradigm, TCIP Paradigm)
- Assisted in editing, analyzing, and graphing data for publications

Barnard College, Psychology Department Personality Lab New York, NY **Aug 2009 - May 2010**
Independent Study
Supervisor: Dr. Tara Well

- Ran lab sessions with other independent study students
- Worked on TAT and goal coding associated with experiment

PUBLICATIONS

Peer-Reviewed Publications

- **Varangis, E.,** Qi, W., Stern, Y. & Lee, S. (2022). The role of neural flexibility in cognitive aging. *NeuroImage, 247*, 117784.
- Sunderaraman, P., Lee, S., **Varangis, E.**, Chapman, S., Joyce, J. L., Barker, M., Hartstone, W., Brickman, A., Stern, Y., & Cosentino, S. (2022). Self-awareness for financial decision making abilities is linked to right temporal cortical thickness in older adults. *Brain Imaging & Behavior, 16*, 1139-1147.
- Stern, Y., **Varangis, E**., & Habeck, C. G. (2021). Identification of a resting bold connectome associated with cognitive reserve. *NeuroImage, 232*, 117875.
- **Varangis, E.**, Habeck, C. G., & Stern, Y. (2021). Task-based functional connectivity in aging: How task and connectivity methodology affect discovery of age effects. *Brain & Behavior, 11,* e01954.
- Simon, S. S., **Varangis, E.**, & Stern, Y. (2020). Does personality predict whole-brain functional connectivity at rest? Evidence across the adult lifespan. *Brain & Behavior, 10*, e01515.
- **Varangis, E.**, Habeck, C. G., Razlighi, Q., & Stern, Y. (2019). The effect of aging on resting state connectivity of predefined networks in the brain. *Frontiers in Aging Neuroscience, 11*, 234.
- **Varangis, E.**, Razlighi, Q., Habeck, C. G., Fisher, Z., & Stern, Y. (2019). Between-network functional connectivity is modified by age and cognitive task domain. *Journal of Cognitive Neuroscience, 31*, 607-622.
- Clark, M. D. & **Varangis, E. M. L.**, Champagne, A. A., Giovanello, K. S., Shi, F., Kerr, Z. Y., Smith, J. K., & Guskiewicz, K. M. (2018). Effects of career duration, concussion history, and playing position on white matter microstructure and functional neural recruitment in former college and professional football athletes. *Radiology, 286*, 967-977.
- Gates, K., Lane, S., **Varangis, E.**, Giovanello, K. S., & Guskiewicz, K. M. (2017). Unsupervised classification during time-series model building. *Multivariate Behavioral Research, 52*, 129-148.
- Kerr, Z., Littleton, A., Cox, L., **Varangis, E.**, DeFreese, J. D., Lynall, R. C., Schmidt, J. D., Marshall, S., & Guskiewicz, K. (2015). Estimating contact exposure in football using the Head Impact Exposure Estimate (HIEE). *Journal of Neurotrauma, 32*, 1083-1089.
- Hildebrandt, T., Shope, S., **Varangis, E.**, Klein, D., Pfaff, D. W., Yehuda, R. (2014). Exercise reinforcement, stress, and β-endorphins: An initial examination of exercise in anabolic-androgenic steroid dependence. *Drug and Alcohol Dependence, 139*, 86-92.
- **Varangis, E.**, Lanzieri, N., Hildebrandt, T., Feldman, M. (2012). Gay Male Attraction Toward Muscularity: Does Mating Context Matter? *Body Image, 9*, 270-278.

Book Chapters

- **Varangis, E.,** Soldan, A., & Stern, Y. (In Press). Cognitive Reserve in Healthy Aging and Neurodegenerative Disease. *The SAGE Handbook of Neuropsychology.* SAGE Publications.
- **Varangis, E.** & Stern, Y. (2020). Cognitive Reserve. *Handbook of Cognitive Aging: A Life Course Perspective*. New York: Cambridge University Press.
- Hildebrandt, T., **Varangis, E.**, & Lai, J. (2011). Performance Enhancing Drug Use in Sport*. Handbook on Sport and Performance Psychology*. London: Oxford University Press.

PRESENTATIONS

- **Varangis, E.** (2022, April). Change in Resting State Connectivity Over Five Years – Evidence from a
- Healthy Adult Lifespan Sample. Presentation conducted at the Cognitive Aging Conference, Atlanta, GA.
- **Varangis, E.**, Habeck, C. G., & Stern, Y. (2021, March). Cognitive Correlates of Longitudinal Change in Functional Connectivity – Evidence from an Adult Lifespan Sample. Poster presented at the Cognitive Neuroscience Society Conference, San Francisco, CA (Virtual).
- **Varangis, E.**, Habeck, C. G., & Stern, Y. (2020, May). The Effect of Age on Longitudinal Measures of Resting State Functional Connectivity. Poster presented at the Cognitive Neuroscience Society Conference, Boston, MA (Virtual).
- **Varangis, E.**, Habeck, C. G., & Stern, Y. (2019, November). The Effect of Age on Longitudinal Measures of Resting State Functional Connectivity. Poster presented at the Taub Institute Research Retreat, Palisades, NY.
- **Varangis, E.**, Habeck, C. G., Razlighi, Q., & Stern, Y. (2019, March). Within- and Between-Network Connectivity in Aging: How Correlation Direction Affects Discovery of Age Effects. Poster presented at the Cognitive Neuroscience Society Conference, San Francisco, CA.
- **Varangis, E.**, Razlighi, Q., Habeck, C. G., & Stern, Y. (2019, January). Between-Network Functional Connectivity is Modified by Age and Cognitive Task Domain. Poster presented at the Dallas Aging & Cognition Conference, Dallas, TX.
- **Varangis, E.** (2018, November). Between-Network Functional Connectivity is Modified by Age and Cognitive Task Domain. Presentation conducted at the Taub Institute Research Retreat, Palisades, NY.
- **Varangis, E.** (2018, October). Functional Connectivity of the Aging Brain. *Neurology Grand Rounds*. Presentation conducted at the Neurological Institute, Columbia University Irving Medical Center, New York, NY.
- **Varangis, E.**, Razlighi, Q., Habeck, C. G., & Stern, Y. (2018, June). Between-Network Functional Connectivity is Modified by Age and Cognitive Task Domain. Poster presented at the Neurology Research Retreat, Palisades, NY.
- **Varangis, E.**, Giovanello, K. S., Mulligan, N., Gates, K., Cohen, J., Thomas, L. C., & Guskiewicz, K. M. (2017, April). Long-term effects of concussion and contact history on cognitive function in middle-adulthood. Poster presented at the Society for Neuroscience – Triangle Chapter Meeting, Cary, NC.
- **Varangis, E.**, Giovanello, K. S., Mulligan, N., Gates, K., Cohen, J., Thomas, L. C., & Guskiewicz, K. M. (2017, March). Long-term effects of concussion and contact history on cognitive function in middle-adulthood. Poster presented at the Cognitive Neuroscience Society, San Francisco, CA.
- **Varangis, E.**, Giovanello, K. S., Lane, S., Gates, K., Clark, M., & Guskiewicz, K. M. (2016, April). Lack of decoupling between default mode and working memory networks associated with no behavioral differences in retired football players. Poster presented at the Cognitive Neuroscience Society, New York, NY.
- **Varangis, E.**, Giovanello, K. S., Lane, S., Gates, K., Clark, M., & Guskiewicz, K. M. (2016, March). Lack of decoupling between default mode and working memory networks associated with no behavioral differences in retired football players. Poster presented at the Triangle Imaging Symposium, Chapel Hill, NC.
- **Varangis, E.**, Giovanello, K. S., Lane, S., Gates, K., Clark, M., & Guskiewicz, K. M. (2016, February). Lack of decoupling between default mode and working memory networks associated with no behavioral differences in retired football players. Poster presented at the North Carolina Cognition Conference, Winston-Salem, NC.
- **Varangis, E.**, Giovanello, K. S., Gates, K., Lane, S., & Guskiewicz, K. M. (2015, September). Dissociation between univariate and functional connectivity fMRI differences during working memory performance in retired football players. *BRIC Grand Opening*. Presentation conducted at the Biomedical Research Imaging Center, Marsico Hall, University of North Carolina at Chapel Hill, Chapel Hill, NC.
- **Varangis, E.** (2015, May). Long-term cognitive effects of concussion: What is lying beneath the surface? *Elon BrainCARE Symposium*. Presentation conducted at the Moseley Center, Elon University, Elon, NC.
- **Varangis, E.**, Giovanello, K. S., Gates, K., Lane, S., & Guskiewicz, K. M. (2015, April). Dissociation between univariate and functional connectivity fMRI differences during working memory performance in retired football players. Poster present at the Society for Neuroscience – Triangle Chapter Meeting, Cary, NC.

- **Varangis, E.**, Giovanello, K. S., Gates, K., Lane, S., & Guskiewicz, K. M. (2015, March). Dissociation between univariate and functional connectivity fMRI differences during working memory performance in retired football players. Poster presented at the Cognitive Neuroscience Society, San Francisco, CA.
- **Varangis, E.**, Giovanello, K. S., Gates, K., Lane, S., & Guskiewicz, K. M. (2015, February). Dissociation between univariate and functional connectivity fMRI differences during working memory performance in retired football players. Poster presented at the North Carolina Cognition Conference, Elon, NC.
- **Varangis, E.**, Giovanello, K. S., Foster, C., Kerr, Z., DeFreese, J. D., & Guskiewicz, K. M. (2014, April). Effects of sport-related concussion and football exposure on the neural mechanisms of working memory. Poster presented at the Cognitive Neuroscience Society Conference, Boston, MA.
- **Varangis, E.**, Giovanello, K. S., Foster, C., Kerr, Z., DeFreese, J. D., & Guskiewicz, K. M. (2014, March). Effects of concussion history and football exposure on working memory performance in retired National Football League and college football players. Poster presented at the North Carolina Cognition Conference, Durham, NC.
- **Varangis, E.**, Giovanello, K. S., Foster, C., Guskiewicz, K. (2013, February). Effects of concussion history and football exposure on working memory performance in retired NFL and college football players. Poster presented at the North Carolina Cognition Conference, Raleigh, NC.
- **Varangis, E.**, Folberth, W., Hildebrandt, T., & Langenbucher, J. (2012, May). Confirmatory factor analysis for the Muscle Dysmorphic Disorder Inventory among male appearance and performance enhancing drug users. Poster presented at the International Conference on Eating Disorders, Austin, TX.
- **Varangis, E.**, Hildebrandt, T., Klein, D., Alfano, L. (2011, April). Initial Validation of the Work for Exercise Task for Anabolic Steroid Users. Poster presented at the International Conference on Eating Disorders, Miami, FL.

SERVICE

Manuscript Reviewer **Mar. 2017 – present**

- Cerebral Cortex
- NeuroImage
- Human Brain Mapping
- Neuropsychologia
- Brain & Behavior
- Frontiers in Aging Neuroscience
- Brain Imaging and Behavior
- Journal of Alzheimer's Disease
- Scientific Reports
- Clinical Journal of Sport Medicine
- Alzheimer's Research & Therapy

NIH Study Section Reviewer **Oct. 2020**

- NIA - R25 Grant Mechanism

North Carolina Science Festival, Chapel Hill, NC **Apr. 2013, 2015, 2016, 2017**

- Staffed booth showcasing neuroscience research done in Dr. Giovanello's Cognitive Neuroscience of Memory Laboratory
- Engaged with members of the community regarding cognitive aging and neuroscience

Minds Matter, New York, NY **Sept. 2011 - May 2012**

- Mentored low-income New York City High School senior
- Met with mentee at least once per week to help with essay-writing, college applications, SAT preparations, and long-term goal setting

American Red Cross National Naval Medical Center, Bethesda, MD **May - Aug. 2009**

- Helped plan Naval Medical Center Family Fun Day, along with the base Command, for over 800 active duty members and their families
- Assisted in organization, recruitment, and orientation of Red Cross Volunteers

TEACHING EXPERIENCE

Teaching Fellow

- Cognitive Psychology (UNC-CH) Spring 2016

Teaching Assistant/Instructor

- Psychology Research Methods (UNC-CH) — Spring 2014, Fall 2014, Spring 2015, Fall 2015
- Statistical Principles of Psychological Research (UNC-CH) — Summer 2014

Instructional Assistant

- Functional Magnetic Resonance Imaging (UNC-CH) — Fall 2016
- Cognitive Psychology (UNC-CH) — Fall 2012, Spring 2013, Fall 2013

Teaching Assistant

- Educational Psychology (Barnard College) — Fall 2009