BIOGRAPHICAL SKETCH

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NAME: **Yunglin Gazes**

eRA COMMONS USER NAME (credential, e.g., agency login): **ygazes**

POSITION TITLE: **Assistant Professor of Neuropsychology**

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Cooper Union, New York	B.S.	05/2001	Engineering
Graduate Center, City University of New York, NY	Ph.D.	02/2009	Cognition, Brain, & Behavior
Columbia University, New York	Postdoctoral	08/2012	Aging and Alzheimer's Disease

A. Personal Statement

My expertise is in understanding the neural underpinnings of cognitive decline in aging and Alzheimer's disease. I have extensive experience in analyzing multi-modal neuroimaging data, especially in Diffusion Weighted Imaging and structural images. My knowledge in MR imaging combined with my overall understanding of the neurodegenerative mechanisms associated with normal and pathological aging makes me well suited to be the co-principal investigator in the current proposal. As part of my K01 award (NIA K01AG051777) and an award from the Alzheimer's Association (AARG-17-529121), I am working with a number of modeling techniques for Diffusion Weighted Imaging including Constrained Spherical Deconvolution and Neurite Orientation Dispersion and Density Imaging, all of which provide different biologically relevant measures of white matter microstructure. I have also performed structural analysis using the latest toolboxes to examine grey and white matter volume/thickness. Overall, my expertise from MRI acquisition to final analysis of diffusion weighted imaging and structural T1 data will be vital to the successful completion of neuroimaging analyses in the proposed study.

1. **Gazes, Y**., Habeck, C., O'Shea, D., Razlighi, Q. R., Steffener, J., & Stern, Y. (2015). Functional network mediates age-related differences in reaction time: a replication and extension study. Brain and Behavior, 5(5). doi: 10.1002/brb3.324. PMCID: PMC4389056
2. **Gazes, Y.,** Bowman, F.D., Razlighi, Q.R., O'Shea, D., Stern, Y., & Habeck, C. (2016). White matter tract covariance patterns predict age-declining cognitive abilities. Neuroimage, 125, 53-60. PMCID: PMC4691375
3. Li, P., Tsapanou, A., Qolamreza, R.R., & **Gazes, Y**. (2018). White matter integrity mediates decline in age-related inhibitory control. Behavioural Brain Research, 339, 249-354. PMCID: PMC5729101
4. **Gazes, Y.,** Li, P., Sun, E., Razlighi, Q., & Tsapanou, A. (2018) Age specificity in fornix-to-hippocampus association. Brain Imaging and Behavior. Sep 5. doi: 10.1007/s11682-018-9958-1.

B. Positions and Honors

Positions and Employment

2001 – 2002 Chemical Inspector, Dept. of Environmental Protection, New York City, NY.
2003 – 2008 Adjunct Lecturer, Psychology Department, Brooklyn College, City University of New York, NY.
2011 Adjunct Assistant Professor, Psychology Department, Hunter College, City University of New York, NY.
2005 – 2008 Research Assistant, Taub Institute, Columbia University, New York, NY.

2009 – 2012 Postdoctoral Research Fellow, Taub Institute, Columbia University, New York, NY.
2012 – 2014 Associate Research Scientist, Taub Institute, Columbia University, New York, NY.
2014, 2016 Adjunct Assistant Professor, Psychology Department, Columbia University, New York, NY.
2014 – Assistant Professor, Department of Neurology, Columbia University, New York, NY.

Professional Memberships

2007 – Member, Society for Neuroscience
2005 – Member, Cognitive Neuroscience Society
2013 – Member, Organization for Human Brain Mapping

C. Contributions to Science

1. My early research focused on exploring various methods to tease out unique functional activation patterns during performance of cognitive tasks. These publications demonstrated functional patterns associated with specific elements of cognitive tasks, contributing to the understanding of neural processes underlying cognitive performance. I was first author on two of the articles and responsible for data analysis for the other article.
   a. **Gazes, Y**., Rakitin, B. C., Steffener, J., Habeck, C., Butterfield, B., Ghez, C., & Stern, Y. (2010). Performance degradation and altered cerebral activation during dual performance: Evidence for a bottom-up attentional system. Behavioural Brain Research, 210(2), 229-239. PMCID: PMC3531229
   b. Soldan, A., Habeck, C., **Gazes, Y**., & Stern, Y. (2010). Neural mechanisms of repetition priming of familiar and globally unfamiliar visual objects. Brain Research, 1343, 122 – 134. PMC2922055.
   c. Blumen*, H.M., **Gazes*, Y**., Habeck, C., Kumar, A., Steffener, J., Rakitin, B.C., & Stern, Y. (2011). Neural Networks Associated with the Speed-Accuracy Tradeoff: Evidence from the Response Signal Method. Behavioural Brain Research, 224(2), 397-402. PMCID: PMC3159733.
   ***Both authors contributed equally to the manuscript.**

2. Another topic that fascinated me in my early research was the effects of sleep deprivation on brain activation and cognition. We used brain activation to understand how sleep deprivation interrupted cognitive processes and also extracted regions with brain activations that are associated with increased alertness during sleep deprivation, thus contributing to unlocking the mechanisms for increasing wakefulness during sleep deprivation. I was first author on one of the articles and was responsible for data analysis for the other article.
   a. Tucker, A.M., Rakitin, B.C., Basner, R.C., **Gazes, Y**., Steffener, J., Stern, Y. (2011). fMRI Activation During Failures to Respond Key to Understanding Performance Changes with Sleep Deprivation. Behavioural Brain Research, 218(1), 73-79. PMCID: PMC3022081.
   b. **Gazes, Y**., Rakitin, B. C., Steffener, J., Habeck, C., Lisanby, S.H., Butterfield, B., Basner, R., Ghez, C., & Stern, Y. (2012). Dual-tasking alleviated sleep deprivation disruption in visuomotor tracking: An fMRI study. Brain and Cognition, 78(3), 248-256. PMCID: PMC3278524.

3. After developing expertise in basic fMRI analysis, I became fascinated with aging effects on brain activations during cognitive tasks and in particular dual-tasking. I learned to conduct covariance analyses on neuroimaging data including PET and fMRI in order to minimize the influence of noise and increase sensitivity to experimental effects. The following publications identified brain patterns that showed age-related differences in the performance of cognitive tasks. I was first author on two of the articles and was involved in data analysis for the other two articles.
   a. Siedlecki, K.L., Habeck, C.G., Brickman, A.M., **Gazes, Y**., & Stern, Y. (2009). Examining the multifactorial nature of cognitive aging with covariance analysis of positron emission tomography data. Journal of the International Neuropsychological Society, 15(6), 973-981. PMCID: PMC2835462.
   b. **Gazes, Y.**, Rakitin, B. C., Habeck, C., Steffener, J., & Stern, Y. (2012). Age differences of multivariate network expressions during task-switching and their associations with behavior. Neuropsychologia, 50(14), 3509-18. PMCID: PMC3518579.
   c. Blumen, H.M., Holtzer, R., Brown, L.L., **Gazes, Y.**, & Verghese, J. (2014). Behavioral and neural correlates of imagined walking and walking-while-talking in older adults. Human Brain Mapping, 35(8), 4090-4104. PMCID: PMC4106989

d. **Gazes, Y.**, Habeck, C., O'Shea, D., Razlighi, Q. R., Steffener, J., & Stern, Y. (2015). Functional network mediates age-related differences in reaction time: a replication and extension study. Brain and Behavior, 5(5). doi: 10.1002/brb3.324. PMCID: PMC4389056

4. Research has identified four cognitive abilities that show unique age-related differences. Our group is working towards understanding the neural underpinnings of these unique cognitive abilities in aging. I was involved as a co-investigator in these publications that are the first few studies to identify brain patterns associated with unique cognitive abilities within the same individuals across a broad age range (20-80 years old).
   a. Stern, Y., Habeck, C., Steffener, J., Barulli, D., **Gazes, Y**., Razlighi, Q., Shaked, D., & Salthouse, T. (2014). The Reference Ability Neural Network Study: Motivation, design, and initial feasibility analyses. Neuroimage, 103C, 139-151. PMCID: PMC4312259
   b. Habeck, C., Steffener, J., Barulli, D., **Gazes, Y**., Shaked, D., Salthouse, T., & Stern, Y. (2015). Making cognitive latent variables manifest: distinct neural networks for fluid reasoning and processing speed. Journal of Cognitive Neuroscience, 27(6):1249-58. PMCID: PMC4416986
   c. **Gazes, Y**., Bowman, F.D., Razlighi, Q.R., O'Shea, D., Stern, Y., & Habeck, C. (2016). White matter tract covariance patterns predict age-declining cognitive abilities. Neuroimage, 125, 53-60. PMCID: PMC4691375
   d. Habeck, C, **Gazes, Y.**, Razlighi, Q.R., Steffener, J., Brickman, A., Barulli, D., Salthouse, T., & Stern, Y. (2016). The Reference Ability Neural Network Study: Life-time stability of reference-ability neural networks derived from task maps of young adults. Neuroimage, 125:693-704. PMCID: PMC4691438

Complete list of published work in MyBibliography:
https://www.ncbi.nlm.nih.gov/sites/myncbi/yunglin.gazes.1/bibliography/45609059/public/?sort=date&direction=ascending

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

NIA K01AG051777 (Gazes) 9/14/2016 – 5/31/2021
Longitudinal changes in white matter integrity predicting cognitive changes in reasoning and vocabulary
Examine longitudinal changes in white matter integrity in association with age-related changes in cognitive abilities using multivariate techniques.
Role: Principal Investigator

AARG-17-529121 (Gazes) 10/1/2017 - 9/30/2020
NODDI vs DTI metrics in predicting amyloid and tau pathology
Test whether novel white matter measures, NODDI, predicts amyloid and tau pathology in pre-clinical Alzheimer's patients.
Role: Principal Investigator

RF1AG038465 (Stern) 07/15/2016 – 06/30/2020
Exploring Cognitive Aging Using Reference Ability Networks
The proposed research program constitutes a major reevaluation of the methods and goals of the study of cognitive aging that should provide major new, integrative, and perhaps simplifying, insights into the neural basis of the most important and central features of cognitive aging.
Role: Co-Investigator

R01AG026158 (Stern) 05/01/2017 - 04/30/2022
Imaging of Cognition, Learning and Memory in Aging
This work will lead to better understanding of how age-related brain changes and advancing AD pathology impact on the neural systems that mediate cognitive function and elucidate the neural mechanisms that differentiate successful from unsuccessful aging. In turn, it should provide clues for remediating or preventing age-related cognitive changes and delaying the onset of AD.

Role: Co-Investigator

R01AG062268 (Huey) 09/01/2018-08/31/2023
Neuroanatomical associations with the factor structure underlying neuropsychiatric symptoms in Alzheimer's disease
Neuropsychiatric symptoms in Alzheimer's disease and related dementias are a major public health problem as they are common, greatly increase the cost of and difficulty of care, and our pharmacological treatments are inadequate. We propose to use a data-driven approach to determine the factors underlying neuropsychiatric symptoms in participants with Alzheimer's disease, the brain networks associated with these factors, and test a novel brief global measure of neuropsychiatric symptoms. The goals are to improve the measurement and classification of neuropsychiatric symptoms in studies of participants with Alzheimer's disease and related dementias, and to identify measures to use and brain networks to target with anatomically-based treatments of neuropsychiatric symptoms, including Transcranial Magnetic Stimulation (TMS).
Roe: Co-Investigator

Completed Research Support

NIH/NIA 2R01AG026158-07 (Stern) 09/15/10 - 05/31/17 (NCE)
Imaging of Cognition, Learning and Memory in Aging
The aims of this study are to better understand the interactions of memory load and aging on brain activity and the associated amyloid burden in healthy older adults.
Role: Co-Investigator

NIA R01AG038465 (Stern) 09/01/11 - 07/31/16
Exploring Cognitive Aging Using Reference Ability Networks
The proposed research program constitutes a major reevaluation of the methods and goals of the study of cognitive aging that should provide major new, integrative, and perhaps simplifying, insights into the neural basis of the most important and central features of cognitive aging.
Role: Co-Investigator

NIH R21DK104105 (Walker) 07/09/2015 - 06/30/2017
Primary Hyperparathyroidism: Neurocognitive Features
Understand the mechanism of cognitive dysfunction in PHPT by examining changes in functional activation, cognition, vasomotor reactivity pre and post-surgical operation which has the accompanying decline in PTH level.
Role: Co-Investigator