

## WAKE FOREST SCHOOL OF MEDICINE CURRICULUM VITAE

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### EDUCATION

2002 Harvard University  
Cambridge, MA  
BA with honors in Applied Mathematics, subfield Medical Sciences

2008 University of North Carolina  
Chapel Hill, NC  
Ph.D. in Biostatistics  
Dissertation Title: Linear models with a generalized AR(1) covariance structure for longitudinal and spatial data.  
Advisor: Lloyd J. Edwards, PhD.

### EMPLOYMENT

#### Academic Appointments

*Wake Forest School of Medicine, Wake Forest University*

2008-2015	Assistant Professor (tenure-track), Division of Public Health Sciences, Department of Biostatistical Sciences
2008-Present	Affiliate, Maya Angelou Center for Health Equity
2009-Present	Member, Laboratory for Complex Brain Networks (LCBN)
2009-Present	Graduate Faculty, Wake Forest University
2009-Present	Joint Appointment, WFSM Translational Science Institute

2010-Present	Member, Center for Bioethics, Health, and Society
2013-2015	Affiliate Faculty, School of Biomedical Engineering and Sciences
2015-Present	Core Faculty, School of Biomedical Engineering and Sciences
2015-Present	Faculty, Neuroscience Program
2015-Present	Associate Professor (tenured), Division of Public Health Sciences, Department of Biostatistical Sciences
2015-Present	Statistical Consultant, Center for Neurobiology of Addiction Treatment (CNAT)
2016-Present	Affiliate, Alzheimer's Disease Research Center, Data Management and Statistics Core
2020-Present	Member, Neuroscience Clinical Trial and Innovation Center
<i>University of North Carolina at Chapel Hill</i>	
2013-2016	Adjunct Assistant Professor, Department of Biostatistics
2016-Present	Adjunct Associate Professor, Department of Biostatistics

### **Professional Experience**

Summer 1997	NASA Intern Hampton, VA
1998-2001	Summer Intern, Virginia Power Department of Distribution Operations Richmond, VA
2001-2002	Undergraduate Research Assistant, Malaria Research School of Engineering and Applied Sciences Harvard University, Cambridge, MA
2003	Graduate Research Assistant Health Promotion and Disease Prevention Center University of North Carolina, Chapel Hill, NC
2003	Graduate Research Assistant UNC-Chapel Hill Medical School University of North Carolina, Chapel Hill, NC

2004-2007	Graduate Research Assistant, Medical Image Presentation Department of Biostatistics University of North Carolina, Chapel Hill, NC
2007-2008	Graduate Research Assistant Initiative for Maximizing Student Diversity (IMSD) Department of Biostatistics University of North Carolina, Chapel Hill, NC

## **ADMINISTRATIVE SERVICE**

### **School of Medicine and Institutional Service**

2009-Present	Research Committee, Maya Angelou Center for Health Equity
2010-2012	Medical Student Research Program, Reviewer
2010-2012	Medical Student Research Day, Judge
2013	K Award Writers' Series, Guest Facilitator
2013-2014	Biomedical Informatics Program Taskforce Committee
2014-2015	High Performance Computing Advisory Committee
2014-2015	High Performance Computing Education Subcommittee
2015-Present	CTSI Biostatistics, Epidemiology and Research Design (BERD) Program, Methodology Consultant
2016-2017	Informatics Director Search Committee
2017	CTSI Career Development Grant (KL2), Reviewer
2018-Present	CTSI Methods Conference Lead Organizer and Chair
2018-Present	Graduate Council Committee, Long-Range Planning and Cross-Campus Initiatives
2019-Present	Mentor, Bridge Mentoring Program
2020-Present	Mentor, Kennedy Hopkins Scholars Mentor Program
2020-Present	Research Operations Committee [Faculty Standing Committee]

## **Divisional and Departmental Service**

2008-2013	Custodial Staff Holiday Gift Organizer, Biostatistical Sciences
2008-2010	Faculty Recruitment Committee, Biostatistical Sciences, Section on Statistical Genetics and Bioinformatics
2010	Faculty Recruitment Committee, Biostatistical Sciences
2010	Space Committee, Biostatistical Sciences
2010	Staff Appreciation Committee, Biostatistical Sciences
2010	Internal Pilot Projects Review Committee, Biostatistical Sciences
2011	Imaging Strategic Planning Committee (Chair), Biostatistical Sciences
2011	Strategic Planning Committee, Biostatistical Sciences
2012	Computing Committee, Public Health Sciences
2012	Computing Review Committee, Biostatistical Sciences
2012-2013	Seminar Series/Committee Head, Biostatistical Sciences
2012-2013	Executive Committee Member, Biostatistical Sciences
2017	Strategic Directions Committee, Biostatistical Sciences
2019-2020	Faculty Recruitment Committee (Chair), Biostatistics and Data Science
2019-Present	PHS Research and Development Fund Committee, Public Health Sciences

## **EXTRAMURAL APPOINTMENTS AND SERVICE**

### **Funding Agency Reviewer**

NIH, Challenge Grant Reviewer, 2009

Netherlands Organization for Scientific Research (NWO, Dutch Research Council)  
External Reviewer, 2012

NIH, Selected as a Participant in the Early Career Reviewer Program, Center for  
Scientific Review, 2013

NIH, NSD-A Study Section Temporary Member, 2016

NIH, BMRD Study Section Temporary Member, 2017

NIH, ZNS1 SRB-D05 Study Section Member, 2019

NIH, BMRD Study Section Temporary Member, 2020

NIH, EITN Study Section Temporary Member, 2020

### **Editorial Boards**

Host Co-Editor, *Frontiers Research Topic*, 2012-2014

Associate Editor, *Biostatistics*, 2018-2020

Associate Editor, *The American Statistician*, 2020-2023

### **Journal Reviewer**

Frontiers in Human Neuroscience

PLoS ONE

Computational Statistics and Data Analysis

Journal of the American Statistical Association

Journal of Applied Statistics

Statistics in Medicine

Frontiers in Computational Neuroscience

NeuroImage

NeuroImage: Clinical

Human Brain Mapping

Biometrical Journal

Drug and Alcohol Dependence

Journal of Statistical Theory and Practice

Network Neuroscience

Network Science

IEEE Transactions on Medical Imaging

Biostatistics

Computational Brain and Behavior

### **PROFESSIONAL MEMBERSHIPS AND SERVICE**

1998-2001	Member, Harvard Japan Society
1998-2002	Member, National Society for Black Engineers
2001-2002	Senior Representative (Board Member) Harvard Society for Black Scientists and Engineers
2006-Present	Member, American Statistical Association (ASA)

2007-2008	Member, Minority Health Broadcast Committee, UNC School of Public Health
2008, 2012	Invited Panelist, Eastern North American Region of the International Biometric Society (ENAR) Fostering Diversity in Biostatistics Workshop
2009-Present	Member, International Biometric Society/ENAR
2010-Present	Member, Organization for Human Brain Mapping
2010-Present	Member, Statistics Without Borders
2010, 2012, 2013, 2018	Participant, ENAR Fostering Diversity in Biostatistics Workshop
2012-2013	Organizing Committee, ENAR Junior Researcher's Workshop
2012	Chair, Session on High-Dimensional Data, International Biometric Conference
2013	Chair, Session on Functional Connectivity, Statistical and Applied Mathematical Sciences Institute (SAMSI)-Neuroimaging Data Analysis Workshop
2012, 2014, 2015, 2017, 2019	Mentor, ASA Diversity Mentoring Program
2014-2016	Appointed Member, ENAR Regional Advisory Board (RAB)
2014-2016	Judge, ENAR Poster Award Competition
2014-2017	Co-Chair, ENAR Fostering Diversity in Biostatistics Workshop
2014-2017	Member, ENAR Diversity Workshop Executive Committee
2016	Invited Panelist, UNC Dept. of Biostatistics PhD Alumni Panel
2016-Present	Member, ASA Section on Statistics in Imaging
2017-2019	Elected Member, ENAR Regional Committee (RECOM)
2018	Invited Panelist, StatFest Conference
2019	Invited Panelist, ASA Diversity Workshop and Mentoring Program
2019	Invited Panel Moderator, StatFest Conference

## **PROFESSIONAL DEVELOPMENT**

2009	Roundtable: Statistics in Medical Imaging
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- 2009 International Biometric Society ENAR Meeting  
Short Course: Statistical Modeling and Analysis of Brain Imaging  
Data International Biometric Society ENAR Meeting
- 2009 Workshop for Junior Researchers  
International Biometric Society ENAR Meeting
- 2010 NetSci-Network Science School and Conference (Attendee)
- 2010 Translational Research Academy, Translational Science Institute  
Wake Forest School of Medicine
- 2010-2011 Statistical and Applied Mathematical Sciences Institute (SAMSI)-  
Program on Complex Networks (Participant)
- 2013 NBCF Nonlinear Analysis Summer Workshop (Participant)

## HONORS AND AWARDS

- 1998 Awarded Scholarship from the National Action Council for  
Minorities in Engineering for Excellence in Mathematics and  
Engineering
- 1998-2002 Awarded Virginia Power/Dominion Power Scholarship for  
Excellence in Mathematics and Engineering
- 2002-2003 Awarded Julie Gatewood Latane Fellowship in Interdisciplinary  
Living
- 2002-2004 Awarded Fryer Fellowship/Merit Scholarship, Department of  
Biostatistics, University of North Carolina
- 2002-2007 Awarded Royster Fellowship/Merit Scholarship, Graduate School,  
University of North Carolina
- 2003-2006,  
2007-2008 Recipient of NICHD Grant for Population Studies,  
Department of Biostatistics (Chirayath Suchindran),  
University of North Carolina
- 2004-2006 Recognized in The Chancellor's List (Honoring America's  
Outstanding Graduate Students)
- 2010-2015 Selected as a Translational Research Academy Scholar (Wake  
Forest School of Medicine)
- 2015 Selected as a Delta Omega Theta Chapter Member, Gillings  
School of Global Public Health, University of North Carolina

2018

Recipient of the Wake Forest School of Medicine Mid-Career  
Investigator in Basic Science Award

## PROFESSIONAL INTERESTS

Network- and Complexity-Based Neuroimaging, Repeated Measures Analysis, Covariance Modeling,  
Health/Social Disparities

## GRANT FUNDING

### Currently Active Grants

NIBIB R01 EB024559-01A1 (**Simpson, PI; 58% effort**) 04/01/2018 – 03/31/2022  
Analytical Tools for Complex Brain Networks: Fusing Novel Statistical Methods and Network Science to  
Understand Brain Function \$298,442 (Current Year)

This project will fuse novel statistical methods with network-based functional neuroimage analysis to engender powerful analytical tools to advance understanding of normal brain function and alterations due to various brain disorders

NIH UL1TR001420 (McClain, PI; **Simpson, Co-I, 10% effort**) 07/01/2019 – 06/30/2024  
Wake Forest Clinical and Translational Science Award \$3,912,940 (Current Year)

The purpose of this Clinical and Translational Science Award (CTSA) application is to synergize the fundamental positive changes that the Translational Science Institute has already brought to bear at Wake Forest Baptist Health. Strategic Goal 5: Promote research sustainability by increasing efficiency through effective organization, governance, collaboration, and communication.

NIAAA P50AA026117 (Weiner, PI; **Simpson, Co-I, 12% effort**) 12/01/2017 – 11/30/2022  
Wake Forest Translational Alcohol Research Center (WF-TARC) \$1,173,801 (Current Year)

This project will focus on craving as a potential marker for AUD vulnerability as it is the primary predictor of AUD relapse.

NIH R01ES008739 (Laurienti, PI; **Simpson, Co-I, 5% effort**) 07/01/2017 – 05/31/2022  
The Effect of Pesticide Exposure On Cognitive and Brain Development In Latino Children: Pace5  
\$432,600 (Current Year)

Most research indicates that prenatal pesticide exposure is detrimental to the developing brain. However, results concerning the effects of postnatal pesticide exposure on brain development are conflicting. The current project will evaluate the effects of pesticide exposure on neurobehavioral and brain development children from Latino farmworker families.

NIA P30AG049638 (Craft, PI; **Simpson, Co-I, 5% effort**) 09/01/2016 – 06/30/2021  
Wake Forest Alzheimer's Disease Research Center: Data Management and Statistical Core  
\$147,513 (Current Year)

The mission of Data Management and Statistical (DMS) Core is to promote excellence in the Wake Forest ADCC by providing outstanding data management, biomedical computing, and analytical support to ADCC investigators and affiliates.



## **Pending Grants**

(Whitlow, PI; **Simpson, Co-I, 5% effort Yr 1, 15% effort Yrs 2-5**) 07/01/2021 – 06/30/2026  
American College of Radiology \$2,000,000 (First Year)  
Neuroimaging, Oculomotor, and Blood-Based Biologic Markers of Persistent Concussive Symptoms in the Early and Middle Adolescent Population.  
Goal: To establish the Scientific Coalition on Understanding Teen Neurotrauma (SCOUT-Neurotrauma) and identify biomarkers of persistent concussive symptoms in the early and middle adolescent population.

(Whitlow, PI; **Simpson, Co-I, 2% effort Yr 1, 5% effort Yr 2**) 09/01/2020 – 08/31/2022  
Michael J Fox Foundation \$240,974 (First Year)  
Use of a Non-Invasive Brainstem Neuromodulation Device to Improve Neurovascular Status in Parkinson's Disease.

## **Past Grant History**

Chronic Effects of Neurotrauma Consortium (CENC), Structural and Functional Neurobiology of Veterans Exposed to Primary Blast Forces, (Taber, PI; Simpson, Co-I, 15% effort), 05/01/2018 – 09/30/2019, \$505,567.

NIBIB K25EB012236-01A1, Statistical Methods for Whole-Brain Connectivity Networks, (Simpson, PI), 09/01/2012 – 04/30/2018, \$745,154.

WFU Translational Scholar Award, Age-Related Whole-Brain Analyses via Exponential Random Graph Modeling Methods, (Simpson, PI), 07/01/2010 - 06/30/2012, \$221,513.

NHLBI, Jackson Heart Study MRI, (Carr, PI; Simpson Co-Investigator), 09/15/2007 – 08/31/2012, \$412,796.

NCMHD, The Native Proverbs 31 Health Project, (Bell, PI; Simpson, Co-Investigator), 11/01/2010 – 10/31/2012, \$275,000.

NHLBI, The Coronary Artery Risk Development in Young Adults (CARDIA), (Carr, PI; Simpson, Biostatistician ) 09/01/2009 - 09/30/2009, \$308,135.

## **BIBLIOGRAPHY (Advised Graduate Students Underlined)**

### **Peer-Reviewed Publications**

#### **METHODOLOGICAL JOURNAL ARTICLES**

1. Muller KE, Edwards LJ, **Simpson SL**, Taylor DJ (2007). Statistical Tests with Accurate Size and Power for Balanced Linear Mixed Models. *Statistics in Medicine* 26, 3639-3660.
2. Johnson JL, Muller KE, Slaughter JC, Gurka MJ, Gribbin MJ, **Simpson SL** (2009). POWERLIB: SAS/IML Software for Computing Power in Multivariate Linear Models. *Journal of Statistical Software* 30, 1-27. PMID: PMC4228969.
3. **Simpson SL**, Edwards LJ, Muller KE, Sen PK, Styner MA (2010). A Linear Exponent AR(1) Family of Correlation Structures. *Statistics in Medicine* 29, 1825-1838. PMID: PMC4020183.  
**\*Now implemented in the MIXED and GLIMMIX procedures in SAS (2018)**
4. **Simpson SL** (2010). An Adjusted Likelihood Ratio Test for Separability in Unbalanced Multivariate Repeated Measures Data. *Statistical Methodology* 7, 511-519.

5. **Simpson SL**, Hayasaka S, Laurienti PJ (2011). Exponential Random Graph Modeling for Complex Brain Networks. *PLoS ONE* 6(5), e20039. PMID: PMC3102079.
6. Telesford QK, **Simpson SL**, Burdette JH, Hayasaka S, Laurienti PJ (2011). The Brain as a Complex System: Using Network Science as a Tool for Understanding the Brain. *Brain Connectivity* 1(4), 295-308. PMID: PMC3621511.
7. **Simpson SL**, Moussa MN, Laurienti PJ (2012). An Exponential Random Graph Modeling Approach to Creating Group-Based Representative Whole-Brain Connectivity Networks. *NeuroImage* 60, 1117-1126. PMID: PMC3303958.
8. **Simpson SL**, Edwards LJ (2013). A Circular LEAR Correlation Structure for Cyclical Longitudinal Data. *Statistical Methods in Medical Research* 22, 296-306.
9. **(Invited Review) Simpson SL**, Bowman FD, Laurienti PJ (2013). Analyzing Complex Functional Brain Networks: Fusing Statistics and Network Science to Understand the Brain. *Statistics Surveys* 7, 1-36. PMID: PMC4189131.
10. **Simpson SL**, Lyday RG, Hayasaka S, March AP, Laurienti PJ (2013). A Permutation Testing Framework to Compare Groups of Brain Networks. *Frontiers in Computational Neuroscience* 7, 171. PMID: PMC3839047.
11. **Simpson SL**, Edwards LJ, Muller KE, and Styner MA (2014). Kronecker Product Linear Exponent AR(1) Correlation Structures for Multivariate Repeated Measures Data. *PLoS One* 9(2), e88864. PMID: PMC3931642.
12. Edwards LJ, **Simpson SL** (2014). An Analysis of 24-Hour Ambulatory Blood Pressure Monitoring Data using Orthonormal Polynomials in the Linear Mixed Model. *Blood Pressure Monitoring* 19, 153-163. PMID: PMC4058995.
13. **Simpson SL**, Edwards LJ, Muller KE, and Styner MA (2014). Separability Tests for High-Dimensional, Low Sample Size Multivariate Repeated Measures Data. *Journal of Applied Statistics* 41, 2450-2461. PMID: PMC4203479.
14. **Simpson SL**, Laurienti PJ (2015). A Two-Part Mixed-Effects Modeling Framework For Analyzing Whole-Brain Network Data. *NeuroImage* 113, 310-319. PMID: PMC4433821.
15. Ip EH, Zhang Q, Sowinski T, **Simpson SL** (2015). Analysis of Feedback Mechanisms with Unknown Delay Using Sparse Multivariate Autoregressive Method. *PLoS One*, 10 (8): e0131371. PMID: PMC4529169.
16. **Simpson SL**, Laurienti PJ (2016). Disentangling Brain Graphs: A Note on the Conflation of Network and Connectivity Analyses. *Brain Connectivity*, 6(2), 95-98. PMID: PMC4779980.
17. **(Invited Review) Solo V**, Poline J-B, Lindquist MA, **Simpson SL**, Bowman FD, Chung MK, Cassidy B (2018). Connectivity in fMRI: Blind Spots and Breakthroughs. *IEEE Transactions on Medical Imaging*, 37(7), 1537-1550. PMID: PMC6291757.
18. **Simpson SL**, Bahrami M, Laurienti PJ (2019). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Network Neuroscience* 3(2), 307-324. PMID: PMC6370463.
19. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2019). A Matlab Toolbox for Multivariate Analysis of Brain Networks. *Human Brain Mapping* 40(1), 175-186. PMID:

PMC6289822.

**\*Top 10% most downloaded papers in Human Brain Mapping (2018-2019)**

20. Mokhtari F, Akhlaghi MI, **Simpson SL**, Wu G, Laurienti PJ (2019). Sliding Window Correlation Analysis: Modulating Window Shape for Dynamic Brain Connectivity in Resting State. *NeuroImage* 189, 655-666. PMID: PMC5911254.
21. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2019). Analysis of Brain Subnetworks Within the Context of Their Whole-Brain Networks. *Human Brain Mapping* 40(17), 5123-5141. PMID: PMC6865778.
22. Bahrami M (PhD Advisee), Lyday RG, Casanova R, Burdette JH, **Simpson SL**, Laurienti PJ (2019). Using Low-Dimensional Manifolds to Map Relationships Between Dynamic Brain Networks. *Frontiers in Human Neuroscience* 13, 430.

APPLICATIONS JOURNAL ARTICLES

23. Lark RK, Williams CL, Stadler D, **Simpson SL**, Henderson RC, Samson-Fang L, Worley G (2005). Serum Prealbumin and Albumin Concentrations Do Not Reflect Nutritional State in Children with Cerebral Palsy. *Journal of Pediatrics* 147, 695-697.
24. Thomas KB, **Simpson SL**, Tarver WL, Gwede CK (2010). Is Social Support From Family Associated with PSA Testing in a Sample of Men? An Exploratory Analysis Using The Health Information National Trends Survey (HINTS) 2005. *American Journal of Men's Health* 4, 50-59.
25. Slager RE, **Simpson SL**, LeVan TD, Poole JA, Sandler DP, Hoppin JA (2010). Rhinitis Associated with Pesticide Exposure Among Private Pesticide Applicators in the Agricultural Health Study. *Journal of Toxicology and Environmental Health, Part A* 73: 20, 1382-1393. PMID: PMC2964833.
26. Telesford Q, Morgan AR, Hayasaka S, **Simpson SL**, Barret W, Kraft RA, Mozolic JL, Laurienti PJ (2010). Reproducibility of graph metrics in fMRI Networks. *Frontiers in Neuroinformatics* 4, 117. PMID: PMC3002432.
27. Webb BC (MD/JD Student), **Simpson SL**, Hairston KG (2011). From Politics to Parity: Using a Health Disparities Index to Guide Legislative Efforts for Health Equity. *American Journal of Public Health* 101, 554-560. PMID: PMC3036688.
28. Bruce MA, Beech BM, Crook ED, Sims M, Griffith DM, **Simpson SL**, Ard J, Norris KC (2013). Sex, Weight Status, and Chronic Kidney Disease Among African Americans: The Jackson Heart Study. *The Journal of Integrative Medicine* 61, 701-707. PMID: PMC4862367.
29. Vaughan L, Leng I, Dagenbach D, Resnick SM, Rapp SR, Jennings JM, Brunner RL, **Simpson SL**, Beavers D, Coker LH, Gaussoin SA, Sink K, Espeland MA (2013). Intra-Individual Variability in Domain-Specific Cognition and Risk of MCI and Dementia. *Current Gerontology and Geriatrics Research*, Article ID 495793. PMID: PMC3881440.
30. McCrory MC, Gower EW, **Simpson SL**, Nakagawa TA, Mou SS, Morris PE (2014). Off-Hours Admission to Pediatric Intensive Care and Mortality. *Pediatrics* 134, e1345-e1353.
31. Moussa MN, **Simpson SL**, Mayhugh RE, Grata ME, Burdette JH, Porrino LJ, Laurienti PJ (2015). Long-Term Moderate Alcohol Consumption Does Not Exacerbate Age-Related Cognitive Decline in Healthy, Community-Dwelling Older Adults. *Frontiers In Aging Neuroscience*, 6, 341. PMID: PMC4283638.

32. Fetterhoff D, Opris I, **Simpson SL**, Deadwyler SA, Hampson RE, Kraft RA (2015). Multifractal Analysis of Information Processing in Hippocampal Neural Ensembles during Working Memory under  $\Delta 9$ -Tetrahydrocannabinol Administration. *Journal of Neuroscience Methods* 244, 136-153. PMID: PMC4312266.
33. Stanley ML, **Simpson SL**, Dagenbach D, Lyday RG, Burdette JH, Laurienti PJ (2015). Changes in Brain Network Efficiency and Working Memory Performance in Aging. *PLoS One* 10(4), e0123950. PMID: PMC4395305.
34. Paolini BM, Laurienti PJ, **Simpson SL**, Burdette JH, Lyday RG, Rejeski WJ (2015). Global Integration of the Hot-State Brain Network of Appetite Predicts Short Term Weight Loss in Older Adults. *Frontiers In Aging Neuroscience* 7, 70. PMID: PMC4423432.
35. Mayhugh RE, Moussa MN, **Simpson SL**, Lyday RG, Burdette JH, Porrino LJ, Laurienti PJ (2016). Moderate-Heavy Alcohol Consumption Lifestyle in Older Adults is Associated with Altered Central Executive Network Community Structure during Cognitive Task. *PLoS One*, 11(8), e0160214. PMID: PMC4975417.
36. Casanova R, Saldana S, **Simpson SL**, Lacy MB, Subauste AR, Blackshear C, Wagenknecht L, Bertoni AG (2016). Predictions of Incident Diabetes in the Jackson Heart Study Using High-Dimensional Machine Learning. *PLoS One* 11(10), e0163942.
37. Tegeler CH, Tegeler CL, Cook JF, Lee SW, Gerdes L, Shaltout HA, Miles CM, **Simpson SL** (2016). A Preliminary Study of the Effectiveness of an Allostatic, Closed-Loop, Acoustic Stimulation Neurotechnology in the Treatment of Athletes with Persisting Post-Concussion Symptoms. *Sports Medicine* 2(1), 39. PMID: PMC5023638.
38. Tegeler CH, Cook JF, Tegeler CL, Hirsch JR, Shaltout HA, **Simpson SL**, Fidali BC, Gerdes L, Lee SW (2017). Clinical, Hemispheric, and Autonomic Changes Associated with use of Closed-Loop, Allostatic Neurotechnology by a Case Series of Individuals with Self-Reported Symptoms of Post-Traumatic Stress. *BMC Psychiatry* 17, 141. PMID: PMC5395741.
39. Bahrami M (PhD Advisee), Laurienti PJ, Quandt SA, Talton J, Pope CN, Summers P, Burdette JH, Chen H, Liu J, Howard TD, Arcury TA, **Simpson SL** (2017). The Impacts of Pesticide and Nicotine Exposures on Latino Farmworkers' Functional Brain Networks. *Neurotoxicology* 62, 138-150. PMID: PMC5654319.
40. McCrory MC, Spaeder MC, Gower EW, Nakagawa TA, **Simpson SL**, Coleman MA, Morris PE (2017). Time of Admission to the PICU and Mortality. *Peds Critical Care Medicine* 18(10), 915-923.
41. Tegeler CL, Gerdes L, Shaltout HA, Cook JF, **Simpson SL**, Lee SW, Tegeler CH (2018). Successful use of Closed-Loop Allostatic Neurotechnology by a Series of Service Members and Veterans with Posttraumatic Stress Symptoms: Self-Reported, and Autonomic Improvements. *Military Medical Research* 4(1), 38.
42. Mokhtari F, Rejeski WJ, Wu G, **Simpson SL**, Burdette JH, Laurienti PJ (2018). Dynamic fMRI Networks Predict Success in a Behavioral Weight Loss Program Among Older Adults. *NeuroImage* 173, 421-433. PMID: PMC5911254.
43. Shaltout HA, Lee SW, Tegeler CL, Hirsch JR, **Simpson SL**, Gerdes L, Tegeler CH (2018). Improvements in Heart Rate Variability, Baroreflex Sensitivity, and Sleep After Use of Closed-Loop Allostatic Neurotechnology by a Heterogeneous Cohort. *Frontiers in Public Health* 6, 116. PMID: PMC5996903.

44. Lee SW, Laurienti PJ, Burdette JH, Tegeler CL, Morgan AR, **Simpson SL**, Gerdes L, Tegeler CH (2019). Functional Brain Network Changes Following use of an Allostatic, Closed-Loop, Acoustic Stimulation Neurotechnology for Military-Related Traumatic Stress. *Journal of Neuroimaging* 29(1), 70-78. PMID: PMC6586033.
45. Peterson H, **Simpson SL**, Laurienti PJ (2019). Wake Forest Alcohol Imagery Set (WFAIS): Development and Validation of a Large Standardized Alcohol Imagery Dataset. *Alcoholism: Clinical and Experimental Research* 43(12), 2559-2567. PMID: PMC6904540.
46. Echouffo-Tcheugui, JB, Chen H, Kalyani RR, Sims M, **Simpson SL**, Effoe V, Correa A, Bertoni AG, Golden SH (2019). Glycemic Markers and Subclinical Cardiovascular Disease Among African-Americans: The Jackson Heart Study. *Circulation: Cardiovascular Imaging* 12(3), e008641.
47. Tegeler CL, Shaltout HA, Lee SW, **Simpson SL**, Gerdes L, Tegeler CH (2020). Pilot Trial of a Noninvasive Closed-Loop Neurotechnology for Stress Related Symptoms in Law Enforcement: Improvements in Self-Reported Symptoms and Autonomic Function. *Global Advances in Health and Medicine* 9.
48. Garg RK, Khan J, Dawe R, Connors J, John S, Prabhakaran S, Kochet M, Bhabad S, **Simpson SL**, Ouyang B, Jhaveri M, Bleck T (2020). The Influence of Diffusion Weighted Imaging Lesions on Outcomes in Patients with Acute Spontaneous Intracerebral Hemorrhage. *Neurocritical Care, In Press*.
49. Burdette JH, Laurienti PJ, Miron LL, Bahrami M, **Simpson SL**, Nicklas BJ, Fanning J, Rejeski WJ (2020). Functional Brain Networks: Unique Patterns with Hedonic Appetite and Confidence to Resist Eating in Older Adults with Obesity. *Obesity, In Press*.
50. Tegeler CL, Shaltout HA, Lee SW, **Simpson SL**, Gerdes L, Tegeler CH (2020). High-Resolution, Relational, Resonance-Based, Electroencephalic Mirroring (HIRREM) Improves Symptoms and Autonomic Function for Insomnia: A Randomized, Placebo-Controlled Clinical Trial. *Brain and Behavior, In Press*.

### **Invited Publications (Editorially Reviewed)**

1. **Simpson SL**, Burdette JH, Laurienti PJ (2015). The Brain Science Interface. *Significance (Magazine of the Royal Statistical Society)* 12(4), 34-39. PMID: PMC4948029.
2. Telesford QK, **Simpson SL**, Kolaczyk ED (2015). Editorial: Complexity and Emergence in Brain Network Analyses. *Frontiers in Computational Neuroscience* 9, 65.
3. Bowman FD, **Simpson SL**, Drake DF (2016). Joint fMRI and DTI Models for Brain Connectivity. In H Ombao, M Lindquist, W Thompson, and J Aston (Eds.), *Handbook of Modern Statistical Methods: Neuroimaging Data Analysis*.
4. **Simpson SL** (2020+). Mixed Modeling Frameworks for Analyzing Whole-Brain Network Data. In A Rasooly and M Ossandon (Eds.), *Bioengineering Technologies (Methods in Molecular Biology Series)*. *In Press*.
5. **Simpson SL** (2020+). Choosing the Approximate Test Statistic and Approximation. In KE Muller and DH Glueck (Eds.), *Power and Sample Size for Multilevel and Longitudinal Designs in Health Research*. Submitted.

### **Miscellaneous Publications**

1. **Simpson SL**, Edwards LJ, Muller KE, Styner MA (2009). A Kronecker Product Linear Exponent AR(1) Family of Correlation Structures for Multivariate Repeated Measures Data. In *JSM Proceedings*, ENAR Section. Alexandria, VA: American Statistical Association, 1302-1316.
2. **Simpson SL**, Hayasaka S, Laurienti PJ (2010). Selecting an Exponential Random Graph Model for Complex Brain Networks. arXiv:1007.3230v1 [stat.AP].
3. **Simpson SL**, Zhu M, Muller KE (2017). A Note on Implementing a Special Case of the LEAR Covariance Model in Standard Software. arXiv:1707.08407v1 [stat.ME].

### **Manuscripts in Preparation**

1. Tegeler CH, Cook JF, Tegeler CL, **Simpson SL**, Hirsch JR, Fidali BC, Gerdes L, Lee SW. Use of an Allostatic Neurotechnology is Associated with Attenuation of Temporal Lobe High Frequency Amplitudes and Improved Sleep in Individuals with Self-Reported PTSD. *Under Revision*.
2. Lee SW, Gerdes L, Cook JF, Tegeler CL, **Simpson SL**, Hirsch JR, Fidali BC, Tegeler CH. Sleep-Specific Improvements after use of Closed-Loop Allostatic Neurotechnology for Post-Traumatic Stress and Insomnia: Case Series. *Under Revision*.
3. Dagenbach D, Tegeler CH, Morgan AR, Lucas K, Laurienti PJ, **Simpson SL**. Effects of an Allostatic Closed-Loop Acoustic Stimulation Neurotechnology (HIRREM<sup>TM</sup>) on the Lateralization of Functional Connectivity in a Military Population with Symptoms of Traumatic Stress. *Journal of Neuroimaging*, *Under Revision*.
4. Peterson H, Mayhugh R, Bahrami M, Rejeski WF, **Simpson SL**, Heilman K, Porges SW, Laurienti PJ. Cardiac Vagal Tone and Functional Brain Network Connectivity in Risky Drinkers. *Network Neuroscience*, *Submitted*.

### **PRESENTATIONS AT PROFESSIONAL MEETINGS**

(Advised Graduate Students Underlined)

1. Gribbin MJ, Johnson JL, **Simpson SL**, Muller KE (2005). Free Power Software for Repeated Measures, MANOVA, and Some Mixed Linear Models Using SAS/IML. *International Biometric Society ENAR Meeting*, Austin, TX (Poster).
2. **Simpson SL**, Muller KE, Coffey CS (2005). Repeated Measures Power for Gaussian Multivariate Linear Models: A Tutorial. *International Biometric Society ENAR Meeting*, Austin, TX (Poster).
3. Thomas KB, **Simpson SL**, Gwede CK (2007). Family Influence and Black Men's Prostate Cancer Screening Behaviors. *Health Information National Trends Survey (HINTS) Conference* (Poster).
4. **Simpson SL**, Edwards LJ, Muller KE, Sen PK (2008). Linear Models with a Generalized AR(1) Covariance Structure. *International Biometric Society ENAR Meeting*, Arlington, VA (Talk).
5. **Simpson SL**, Edwards LJ, Muller KE (2009). Kronecker Product Linear Exponent AR(1) Correlation Structures for Multivariate Repeated Measures. *International Biometric Society ENAR Meeting*, San Antonio, TX (Talk).

6. **Simpson SL**, Edwards LJ, Muller KE (2009). Kronecker Product Linear Exponent AR(1) Correlation Structures for Multivariate Repeated Measures. *Joint Statistical Meetings*, Washington, DC (Poster).
7. **Simpson SL**, Edwards LJ (2010). A Circular LEAR Correlation Structure for Cyclical Longitudinal Data. *International Biometric Society ENAR Meeting*, New Orleans, LA (Talk).
8. Espeland MA, Dagenbach D, Jennings JM, Brunner RL, Resnick SM, Beavers D, **Simpson SL**, Coker LH, Gaussoin SA, Sink K, and Rapp SR (2010). Variability in Domain-Specific Cognitive Function and Incident Dementia: The Women's Health Initiative Study of Cognitive Aging. *Presented at the North Carolina Cognition Group Meeting*, Winston-Salem, NC (Talk).
9. **Simpson SL**, Hayasaka S, Laurienti PJ (2010). Exponential Random Graph Modeling for Complex Brain Networks. *Organization for Human Brain Mapping Meeting*, Barcelona, Spain (Poster).
10. Telesford Q, Hayasaka S, **Simpson SL**, Morgan AR, Laurienti PJ (2010). Reproducibility of Graph Metrics in the At-Rest fMRI Network. *Organization for Human Brain Mapping Meeting*, Barcelona, Spain (Poster).
11. Entrikin DW, Carr JJ, Taylor HA, **Simpson SL**, Fox ER, Terry JG (2010). Global LV Function by Cardiac MRI: Comparison of a Planimetric and Mathematical Model-Based Approach for Image Analysis in the Jackson Heart Study. *Jackson Heart Study Scientific Conference—Special Invitation*, Jackson, MS (Poster).
12. Carr JJ, **Simpson SL**, Terry JG, Gordy B, Liu J, Ding J, Harman JL, Hundley GW, Taylor HA (2010). Pericardial Adipose Tissue and Left Ventricular Dysfunction in African Americans: The Jackson Heart Study. *Jackson Heart Study Scientific Conference—Special Invitation*, Jackson, MS (Poster).
13. Carr JJ, **Simpson SL**, Terry JG, Sims M, Taylor HA (2010). Metabolic Syndrome and Diabetes are Associated with a High Prevalence of Subclinical Atherosclerosis in African Americans: The Jackson Heart Study. *Jackson Heart Study Scientific Conference—Special Invitation*, Jackson, MS (Poster).
14. Terry JG, **Simpson SL**, Carr JJ, Buxbaum SG, Sims M, Hundley G, Entrikin DW, Vitek TR, Taylor HA (2010). Association of Traditional Risk Factors and Coronary Artery Calcified Plaque with Regional Left Ventricular Function by Myocardial Tagging MRI in African Americans: The Jackson Heart Study. *Jackson Heart Study Scientific Conference—Special Invitation*, Jackson, MS (Poster).
15. Terry JG, **Simpson SL**, Carr JJ, Buxbaum SG, Sims M, Hundley G, Entrikin DW, Vitek TR, Taylor HA (2010). Association of Traditional Risk Factors and Coronary Artery Calcified Plaque with Regional Left Ventricular Function by Myocardial Tagging MRI in African Americans: The Jackson Heart Study. *Radiological Society of North America*, Chicago, IL (Talk).
16. **Simpson SL**, Hayasaka S, Laurienti PJ (2010). Exponential Random Graph Modeling for Complex Brain Networks. *International Biometric Conference*, Florianopolis, Brazil (Poster).
17. Carr JJ, **Simpson SL**, Terry JG, Gordy B, Liu J, Ding J, Harman JL, Hundley GW, Taylor HA (2011). Pericardial Adipose Tissue and Left Ventricular Dysfunction in African Americans: The Jackson Heart Study. *American Heart Association EPI/NPAM*, Atlanta, GA (Moderated Poster).
18. Carr JJ, **Simpson SL**, Terry JG, Sims M, Smith C, Taylor HA (2011). Metabolic Syndrome and Diabetes are Associated with a High Prevalence of Subclinical Atherosclerosis in African

- Americans: The Jackson Heart Study. *American Heart Association EPI/NPAM*, Atlanta, GA (Poster).
19. Terry JG, **Simpson SL**, Smith CL, Carr JJ, Hairston KG, Register TC, Ding J, North KE, Feitosa MF, Wojczynski MK, Borecki IB (2012). Race and Sex Influence the Associations of Subcutaneous and Visceral Adipose Tissues with Calcified Plaque of the Coronary and Abdominal Aortic Arteries: The Family Heart Study. *American Heart Association EPI/NPAM*, San Diego, CA (Talk).
  20. Espeland MA, Dagenbach D, Jennings JM, Brunner RL, Resnick SM, Beavers D, **Simpson SL**, Coker LH, Gaussoin SA, Sink K, Rapp SR (2012). Relative Deficits in Domain-Specific Cognitive Function and Risk of Dementia. *Society for Behavioral Medicine*, New Orleans, LA.
  21. Espeland MA, Dagenbach D, Jennings JM, Brunner RL, Resnick SM, Beavers D, **Simpson SL**, Coker LH, Gaussoin SA, Sink K, Rapp SR (2012). Relative Deficits in Domain-Specific Cognitive Function and Risk of Dementia. *Women's Health Initiative Investigator Meeting*, Washington, DC.
  22. **Simpson SL**, Moussa MN, Laurienti PJ (2012). An Exponential Random Graph Modeling Approach to Creating Group-Based Representative Whole-Brain Connectivity Networks. *Organization for Human Brain Mapping Meeting*, Beijing, China (Poster).
  23. **Simpson SL**, Edwards LJ, Muller KE (2012). Kronecker Product Linear Exponent AR(1) Correlation Structures and Separability Tests for Multivariate Repeated Measures Data. *International Biometric Conference*, Kobe, Japan (Talk)
  24. Bruce MA, Whitt-Glover M, Beech BM, Griffith D, Sims M, **Simpson SL**, Ard J, Norris K (2012). Gender, Weight Status, and CKD Among African Americans: The Jackson Heart Study. *Obesity*, San Antonio, TX (Poster).
  25. McGowin IV, Peiffer AM, Bourland JD, **Simpson SL**, Rawley JB, Godwin DW, Rowland JA (2013). MEG: Quantitative Comparison of Oscillations and Synchronization Differences/Similarities in Post-Surgery/Pre-Irradiation Patients and Control Subjects. *The American Association of Physicists in Medicine Meeting*, Indianapolis, IN (Poster).
  26. McCrory MC, Gower EW, **Simpson SL**, Nakagawa TA, Mou SS, Morris PE (2014). Off-Hours Admission and Mortality in Pediatric Intensive Care. *Society of Critical Care Medicine (SCCM)*, San Francisco, CA (Poster).
  27. Casanova R, Saldana S, **Simpson SL**, Lacy MB, Subauste AR, Blackshear C, Wagenknecht L, Bertoni A (2015). Prediction of Incident Diabetes in the Jackson Heart Study Cohort Using Random Forests. *American Diabetes Association (ADA)*, Boston, MA (Poster).
  28. Bahrami M (PhD Advisee), Laurienti PJ, Sandberg JC, Daniel SS, Arcury TA, **Simpson SL** (2016). The Impact of Pesticides on Latino Farmworkers' Functional Brain Networks. *NIEHS Environmental Health Science FEST*, Research Triangle Park, NC (Poster).
  29. Bahrami M (PhD Advisee), Laurienti PJ, Arcury TA, **Simpson SL** (2017). The Impacts of Pesticide and Nicotine on Functional Brain Networks in Latino Farmworkers. *North Carolina Cognition Group Conference*, University of North Carolina at Greensboro, Greensboro, NC (Poster).
  30. Tegeler CL, Howard LJ, Schmidt KD, Cook JF, Kumar S, **Simpson SL**, Lee SW, Gerdes L, Tegeler CH (2017). Use of a Closed-Loop Acoustic Stimulation Neurotechnology Improves Symptoms of Moderate to Severe Insomnia: Results of a Placebo-Controlled Trial. *Sleep Meeting*, Boston, MA (Poster).



31. Bahrami M (PhD Advisee), Laurienti PJ, Arcury TA, **Simpson SL** (2017). Brain Networks in Latino Farmworkers with Chronic Exposures to Pesticides. *Biomedical Engineering Society (BMES) Meeting*, Phoenix, AZ (Poster).
32. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2018). A Matlab Toolbox for Multivariate Analysis of Brain Networks. *Statistical Methods in Imaging (SMI) Conference*, University of Pennsylvania, Philadelphia, PA.
33. Mayhugh R, Rejeski WJ, Bahrami M, **Simpson SL**, Heilman K, Porges S, Gauvin L, Laurienti PJ (2018). Relationship Between Functional Brain Connectivity and Cardiac Vagal Functioning in Moderate to Heavy Alcohol Consumers. *Research Society on Alcoholism Conference*, San Diego, CA (Poster).
34. **Simpson SL** (2018). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *International Biometric Conference*, Barcelona, Spain (Talk).
35. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2018). A Matlab Toolbox for Multivariate Analysis of Brain Networks. *Biomedical Engineering Society (BMES) Meeting*, Atlanta, GA (Poster).
36. Mokhtari F, Bouzan MA, **Simpson SL**, Laurienti PJ (2018). Optimizing Spectral Properties of Sliding Window Correlation Analysis for Dynamic Brain Connectivity During Rest. *Biomedical Engineering Society (BMES) Meeting*, Atlanta, GA (Talk).
37. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2019). Analyzing Local Subnetworks: Context is Everything. Satellite Conference: Network Neuroscience. *Network Science (NetSci) Meeting*, Burlington, VT (Poster).
38. Peterson H, Mayhugh R, Rejeski WJ, Bahrami M, **Simpson SL**, Heilman K, Porges SW, Laurienti PL (2019). Relationship Between Cardiac Vagal Tone and Functional Brain Connectivity in Moderate to Heavy Alcohol Consumers. Satellite Conference: Network Neuroscience. *Network Science (NetSci) Meeting*, Burlington, VT (Talk).
39. Peterson H, Bahrami M, **Simpson SL**, Rejeski WJ, Laurienti PJ (2020). Differential Functional Brain Network Topology During Periods of Normal Drinking and Abstinence in Moderate to Heavy Alcohol Consumers. *Accepted for presentation at the Research Society on Alcoholism Scientific Meeting, scheduled for June 2020 in New Orleans, LA; meeting canceled due to coronavirus pandemic.*

#### **PRESENTATIONS AT OTHER VENUES (Advised Graduate Students Underlined)**

1. **Simpson SL**, Muller KE, Ray S. (2006). Correlation as a Function of Distance for Discrete M-Rep Features. *Presented to the Medical Image Display and Analysis Group, Shape Statistics Meeting, University of North Carolina at Chapel Hill.*
2. **Simpson SL**, Muller KE, Jeong JY (2006). Tangent Variable Representation in M-Rep Analysis. *Presented to the Medical Image Display and Analysis Group, Shape Statistics Meeting, University of North Carolina at Chapel Hill.*
3. **Simpson SL** (2007). Medical Image Analysis. *Presented to the Royster Society of Fellows, University of North Carolina at Chapel Hill.*
4. **Simpson SL**, Edwards LJ, Muller KE, Sen PK, Styner MA (2008). Linear Models with a Generalized AR(1) Covariance Structure for Longitudinal And Spatial Data. *Presented to the Division of Biostatistics, Department of Epidemiology and Health Policy Research, University of Florida at Gainesville.*

- *Department of Biostatistics, University of Alabama at Birmingham.*
  - *Department of Biostatistics, Bioinformatics, and Epidemiology, Medical University of South Carolina.*
  - *Department of Biostatistics and Bioinformatics, Duke University.*
  - *Department of Biostatistics, Virginia Commonwealth University.*
  - *Department of Biostatistical Sciences, Wake Forest School of Medicine.*
  - *Medical Image Display and Analysis Group, Shape Statistics Meeting, University of North Carolina at Chapel Hill.*
  - *Neuroimaging Research Group, Neuroimaging Seminar Series, University of North Carolina at Chapel Hill.*
  - *Advanced Neuroscience Imaging Research Laboratory, Wake Forest School of Medicine.*
5. **Simpson SL** (2009). Exponential Random Graph Models. *Presented to the Laboratory for Complex Brain Networks, Wake Forest University.*
  6. **Simpson SL** (2009). An Overview of the LEAR Correlation Model and its Adaptations for Within-Subject Covariance Modeling. *Presented to the Department of Biostatistical Sciences, Wake Forest School of Medicine.*
  7. **Simpson SL** (2010). Whole-Brain Networks: A Brief Overview of Challenges and a Potential Solution. *Presented to the Division of Public Health Sciences, Wake Forest School of Medicine.*
  8. Telesford Q, Hayasaka S, **Simpson SL**, Morgan AR, Laurienti PJ (2010). Reproducibility of Graph Metrics in the At-Rest fMRI Network. *Virginia Tech-Wake Forest School of Biomedical Engineering and Sciences Research Symposium, Winston-Salem, NC.*
  9. **Simpson SL** (2010). Modeling Whole-Brain Networks: A Brief Overview of Challenges and Potential Solutions. *Presented to the Department of Biostatistics and Bioinformatics, Emory University.*
  10. **Simpson SL** (2010). Modeling Whole-Brain Networks: A Brief Overview of Challenges and Potential Solutions. *Presented to the Department of Biostatistical Sciences, Wake Forest School of Medicine.*
  11. Edwards LJ, **Simpson SL** (2011). Analysis of 24-Hour Ambulatory Blood Pressure Monitoring Data using Orthonormal Polynomials in the Linear Mixed Model. *Presented to the NC TraCS Institute's Biostatistics Core, University of North Carolina at Chapel Hill.*
  12. **Simpson SL** (2011). Modeling Whole-Brain Networks: A Brief Overview of Challenges and Potential Solutions. *Presented to the Translational Research Academy (TRAc), Wake Forest School of Medicine.*
  13. **Simpson SL** (2014). Analyzing Complex Functional Brain Networks: Fusing Statistics and Network Science to Understand the Brain. *Presented to the Department of Biostatistical Sciences, Wake Forest School of Medicine.*
  14. Bahrami M (PhD Advisee), Laurienti PJ, Arcury TA, **Simpson SL** (2016). A Mixed-Effects Modeling Approach to Study the Impact of Pesticides on Farmworkers' Brain Networks Using R-fMRI Data. *School of Biomedical Engineering and Science (SBES) Symposium, Wake Forest School of Medicine, Winston-Salem, NC.*

15. Bahrami M (PhD Advisee), Laurienti PJ, Arcury TA, **Simpson SL** (2017). The Impacts of Pesticide and Nicotine on Functional Brain Networks in Latino Farmworkers. *School of Biomedical Engineering and Science (SBES) Symposium*, Wake Forest School of Medicine, Winston-Salem, NC.
16. **Simpson SL** (2018). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Presented to the Department of Biostatistical Sciences, Wake Forest School of Medicine*.
17. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2018). A Matlab Toolbox for Multivariate Analysis of Brain Networks. *School of Biomedical Engineering and Science (SBES) Symposium*, Wake Forest School of Medicine, Winston-Salem, NC.
18. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2018). A Matlab Toolbox for Multivariate Analysis of Brain Networks. *Carolina Networks Research Group (NRG)*, University of North Carolina at Chapel Hill, Chapel Hill, NC.
19. Singleton O, Bahrami M, Lyday R, Rowland JA, Rogers E, Dobbins DL, **Simpson SL**, Godwin DW (2018). Graph Theoretical Analysis of Brain Networks in Traumatic Brain Injury in OIF/OEF Veterans. *Neuroscience Research Day*, Wake Forest School of Medicine, Winston-Salem, NC.
20. Bahrami M (PhD Advisee), Laurienti PJ, **Simpson SL** (2019). Analysis of Brain Subnetworks Within the Context of Their Whole-Brain Networks. *School of Biomedical Engineering and Science (SBES) Symposium*, Wake Forest School of Medicine, Winston-Salem, NC.
21. Khodaei M (PhD Advisee), Laurienti PJ, **Simpson SL**, Arcury TA, Burdette JH (2020). White Matter Decline in Latinx Children from Farmworker Families. *School of Biomedical Engineering and Science (SBES) Symposium*, Wake Forest School of Medicine, Winston-Salem, NC.

## **INVITED EXTRAMURAL PRESENTATIONS AND SEMINARS**

(Advised Graduate Students Underlined)

1. **Simpson SL** (2011). Modeling Whole-Brain Networks: A Brief Overview of Challenges and Potential Solutions. *Presented to the Department of Biostatistics and Bioinformatics, University of Colorado at Denver*.
2. **Simpson SL** (2012). Modeling Complex Functional Brain Networks: A Brief Overview of Challenges and Potential Solutions. Invited Session: Statistical Issues in Modeling fMRI Data. *Joint Statistical Meetings*, San Diego, CA.
3. **Simpson SL** (2012). Keynote Speaker. Diversity Mentor Lunch (DML) Series for the NIH Sponsored Initiative for Maximizing Student Diversity (IMSD) Program. *University of North Carolina at Chapel Hill*.
4. **Simpson SL** (2013). Analyzing Complex Functional Brain Networks: Fusing Statistics and Network Science to Understand the Brain. *Presented to the Department of Biostatistics, University of North Carolina at Chapel Hill*.
5. **Simpson SL** (2013). Analyzing Resting-State fMRI Brain Networks: Fusing Statistics and Network Science to Understand the Brain. (Invited Talk) Topic-Contributed Session: Challenges and Statistical Approaches of Resting-State fMRI. *Joint Statistical Meetings*, Montreal, Canada.

6. Edwards LJ, **Simpson SL** (2013). Analysis of 24-Hour Ambulatory Blood Pressure Monitoring Data using Orthonormal Polynomials in the Linear Mixed Model. *Presented to the Department of Epidemiology and Population Health, Albert Einstein College of Medicine.*
7. **Simpson SL** (2013). Analyzing Complex Functional Brain Networks: Fusing Statistics and Network Science to Understand the Brain. *Presented to the Department of Biostatistics and Epidemiology, University of Pennsylvania.*
8. **Simpson SL** (2014). Analyzing fMRI Whole-Brain Networks: Fusing Statistics and Network Science to Understand the Brain. Late Breaking Invited Session: Statistical Science and the President's Brain Initiative. *Joint Statistical Meetings, Boston, MA.*
9. **Simpson SL** (2014). A Two-Part Mixed-Effects Modeling Framework for Analyzing Whole-Brain Network Data. (Invited Talk) Topic-Contributed Session: The Graphical Modelling and Longitudinal Analysis of fMRI Data. *Joint Statistical Meetings, Boston, MA.*
10. **Simpson SL** (2015). A Two-Part Mixed-Effects Modeling Framework for Analyzing Whole-Brain Network Data. *Presented to the Department of Biostatistics, Columbia University.*
11. **Simpson SL**, Laurienti PJ (2015). Disentangling Brain Graphs: The Conflation of Network and Connectivity Analyses. (Invited Talk) Topic-Contributed Session: Statistical Methods for Improved Processing and Analysis of fMRI Data. *Joint Statistical Meetings, Seattle, WA.*
12. **Simpson SL** (2015). Webinar Speaker. Massachusetts Institute of Technology (MIT) Online Science Technology, and Engineering Community (MOSTEC).
13. **Simpson SL**, Laurienti PJ (2016). Disentangling Brain Graphs: The Conflation of Network and Connectivity Analyses. Invited Talk Session: Inference for Brain Networks. *International Biometric Society ENAR Meeting, Austin, TX.*
14. **Simpson SL**, Laurienti PJ (2016). Disentangling Brain Graphs: The Conflation of Network and Connectivity Analyses. *Statistical and Applied Mathematical Sciences Institute (SAMSI)-Program on Challenges in Computational Neuroscience (CCNS), Structural Connectivity Working Group. Webinar.*
15. **Simpson SL**, Laurienti PJ (2016). Disentangling Brain Graphs: The Conflation of Network and Connectivity Analyses. *Statistical and Applied Mathematical Sciences Institute (SAMSI)-Program on Challenges in Computational Neuroscience (CCNS), Transition Workshop. Durham, NC.*
16. **Simpson SL**, Laurienti PJ (2016). Disentangling Brain Graphs: The Conflation of Network and Connectivity Analyses. Invited Satellite Symposium: Brain Networks (2<sup>nd</sup> Edition). *Network Science (NetSci) Meeting, Seoul, South Korea.*
17. Bahrami M (PhD Advisee), **Simpson SL**, Arcury TA, Laurienti PJ (2016). A Mixed-Effects Modeling Approach to Study the Impact of Pesticides on Farmworkers' Brain Networks Using RS-fMRI Data. Invited E-Poster Session: The Extraordinary Power of Data. *Joint Statistical Meetings, Chicago, IL.*
18. **Simpson SL** (2016). Distinguished Alumni Speaker. 6<sup>th</sup> Annual Initiative for Maximizing Student Diversity (IMSD) Research Symposium. *University of North Carolina at Chapel Hill.*
19. **Simpson SL** (2016). Webinar Speaker. Massachusetts Institute of Technology (MIT) Online Science Technology, and Engineering Community (MOSTEC).
20. **Simpson SL** (2017). Multivariate Modeling and Inference for Brain Networks: ERGMs and Mixed Models. Invited Educational Workshop: Taking Connectivity to a Skeptical Future:

Challenges, Tools and Techniques. *Organization for Human Brain Mapping Meeting*, Vancouver, Canada.

21. **Simpson SL** (2017). Analyzing Complex Functional Brain Networks: Fusing Statistics and Network Science to Understand the Brain. *Presented to the Mathematics and Statistics Club, Department of Mathematics, Winston-Salem State University.*
22. **Simpson SL** (2018). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Presented to the Department of Biostatistics, Johns Hopkins University.*
23. **Simpson SL** (2018). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Presented to the Department of Biostatistics, University of Alabama at Birmingham.*
24. **Simpson SL** (2018). Analyzing Complex Functional Brain Networks: Fusing Statistics and Network Science to Understand the Brain. *Presented at the 2018 Division of Public Health Sciences Research Symposium, Wake Forest School of Medicine.*
25. **Simpson SL** (2018). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Presented to the Department of Biostatistics, University of North Carolina at Chapel Hill.*
26. **Simpson SL** (2019). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Presented to the Yale Neuroimaging Seminar Series, Yale University.*
27. **Simpson SL** (2019). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *Presented at the Department of Psychology's Seminar on Analysis and Measurement (SAM), Wake Forest University.*
28. **Simpson SL** (2020). A Mixed Modeling Framework for Analyzing Multitask Whole-Brain Network Data. *(To Be) Presented to the Biostatistics Division, Albert Einstein College of Medicine.*
29. **Simpson SL** (2020). (To Be Presented) Mixed Modeling Methods for Whole-Brain Network Data. Invited Talk Session: Statistics in Neuroscience. *International Conference of the European Consortium for Informatics and Mathematics Working Group on Computational and Methodological Statistics (CMStatistics)*, London, England.
30. **Simpson SL** (2021). (To Be Presented) Mixed Modeling Methods for Whole-Brain Network Data. Invited Talk Session: Novel Statistical Methods for Statistically Challenging Data (CO047). *International Conference on Computational Statistics (COMPSTAT)*, Bologna, Italy.

## DIDACTIC/SYSTEMATIC INSTRUCTION

University of North Carolina-Chapel Hill, Department of Biostatistics  
Teaching Assistant, Survival and Categorical Data Analysis  
2004

University of North Carolina-Chapel Hill, Graduate School  
Co-Instructor, Biostatistics Short Course for biomedical graduate students and post-docs  
2007

Wake Forest School of Medicine, Medical School

Standardized Patient Assessment Exam Evaluator (5.4 hours)  
2009

Jackson Heart Study Scientific Conference  
Co-Instructor, Imaging Analysis Workshop  
2010

Wake Forest School of Medicine, Medical School  
Standardized Patient Assessment Exam Evaluator (8.6 hours)  
2010

Wake Forest School of Medicine, Clinical and Population Translational Science Program  
Course Director/Instructor, CPTS 732: Applied Linear Models (4.0 hours)  
2012

Wake Forest School of Medicine, Medical School  
Faculty Evaluator, PREP Program Journal Club  
2012

Wake Forest School of Medicine, Biomedical Engineering Program  
Course Co-Director/Co-Instructor, BMES 7085: Nonlinear Dynamics – Directed Study  
2013

Wake Forest School of Medicine, Biomedical Engineering Program  
Course Co-Director/Co-Instructor, BMES 3304: Multifractal Analysis of Time Series Data –  
Directed Study  
2014

Wake Forest University Graduate School of Arts and Sciences  
Founding Co-Director, Biomedical Informatics Program  
2014-Present

## **MENTORING RELATIONSHIPS**

### **Graduate Students**

2008-2009      Bryant Cameron Webb  
MD Student  
Topic: Using a Health Disparities Index to Evaluate the Efficacy of Minority  
Health Legislation  
Maya Angelou Center for Health Equity, Wake Forest School of Medicine

2010-2013      Karen Joyce  
Dissertation Committee Member  
PhD student, Biomedical Engineering,  
Wake Forest Graduate School of Arts and Sciences

- 2012-2014 Michael McCrory  
Thesis Committee Member  
CPTS Student, Wake Forest Graduate School of Arts and Sciences
- 2012-2015 Brielle Paolini  
(Chair) Dissertation Committee  
MD/PhD Student, Neuroscience,  
Wake Forest Graduate School of Arts and Sciences
- 2012-2016 Satria Sajuthi  
Dissertation Committee Member  
PhD Student, Molecular Genetics and Genomics,  
Wake Forest Graduate School of Arts and Sciences
- 2013-2014 Pelbreton Balfour  
Thesis Committee Member  
CPTS Student, Wake Forest Graduate School of Arts and Sciences
- 2014-2015 Malaak Moussa  
Dissertation Committee  
PhD Student, Neuroscience, Wake Forest Graduate School of Arts and Sciences
- 2014-2018 Rhiannon Mayhugh  
(Chair) Dissertation Committee  
PhD Student, Neuroscience, Wake Forest Graduate School of Arts and Sciences
- 2015-2019 Mohsen Bahrami  
Co-Advisor  
PhD Student, Biomedical Engineering,  
Wake Forest Graduate School of Arts and Sciences
- 2016-2018 Fatemeh Mokhtari  
Dissertation Committee  
PhD Student, Biomedical Engineering,  
Wake Forest Graduate School of Arts and Sciences
- 2016-2017 Abdullahi Oseni  
Thesis Committee Member  
CPTS Student, Wake Forest Graduate School of Arts and Sciences
- 2016 Katelyn McNab  
Summer Internship Supervisor/Advisor  
MS Student, Mathematics and Statistics  
Wake Forest Graduate School of Arts and Sciences
- 2017-2019 Omar Singleton  
Thesis Committee Chair  
MS Student, Health Disparities in Neuroscience-Related Disorders  
Wake Forest Graduate School of Arts and Sciences

- 2019 Hope Peterson  
Research Rotation Faculty Advisor  
PhD Student, Neuroscience, Wake Forest Graduate School of Arts and Sciences
- 2019-Present Hope Peterson  
Dissertation Committee Chair  
PhD Student, Neuroscience, Wake Forest Graduate School of Arts and Sciences
- 2020-Present Mohammad Reza Khodaei  
Co-Advisor  
PhD Student, Biomedical Engineering,  
Wake Forest Graduate School of Arts and Sciences
- 2020-Present Chalmer Tomlinson  
Co-Advisor  
PhD Student, Biostatistics,  
UNC-Chapel Hill Gillings School of Global Public Health

### **Postdoctoral Fellows**

- 2020-Present Mohsen Bahrami, PhD  
Postdoctoral Advisor  
Postdoctoral Research Fellow, Wake Forest School of Medicine
- 2020-Present Nequesha Mohammed, MD  
Postdoctoral Mentor (via the Kennedy Hopkins Scholars Mentor Program)  
Postdoctoral Research Fellow (Orthopedics), Wake Forest School of Medicine

### **Faculty**

- 2019-Present Joseph Rigdon, PhD, Assistant Professor  
Faculty Mentoring Committee Member, PHS-Biostatistics and Data Science
- 2020-Present Heather Shappell, PhD, Assistant Professor  
Faculty Mentoring Committee Chair, PHS-Biostatistics and Data Science

### **COMMUNITY ACTIVITIES AND SERVICE**

- 2000-2002 Dearborn Middle School Tutoring/Mentoring Program  
Boston, MA
- 2006-2008 Orange Correctional Community Volunteer  
Hillsborough, NC
- 2012 Cook Elementary School Science Fair Mentor
- 2013-Present EquityRX, Inc. Health Disparities Index Leadership Team
- 2014-2015 Senior Academy Drop-Out Prevention Mentor, Winston-Salem Chamber of  
Commerce and Winston-Salem/Forsyth County Schools



2019-Present RiverRun International Film Festival Board of Directors Member  
2020-Present RiverRun International Film Festival Executive Committee (Secretary)

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Title: WAKE FOREST UNIVERSITY  
Subject:  
Author: Carl Langefeld  
Keywords:  
Comments:  
Creation Date: 6/11/2020 11:08:00 AM  
Change Number: 37  
Last Saved On: 8/12/2020 2:10:00 PM  
Last Saved By: Sean L. Simpson  
Total Editing Time: 229 Minutes  
Last Printed On: 8/12/2020 3:32:00 PM  
As of Last Complete Printing  
Number of Pages: 25  
Number of Words: 8,434 (approx.)  
Number of Characters: 48,075 (approx.)