

WAKE FOREST UNIVERSITY SCHOOL OF MEDICINE CURRICULUM VITAE

NAME: Sean L. Simpson, PhD.

CURRENT ACADEMIC TITLE: Assistant Professor

BUSINESS ADDRESS: Wake Forest University Health Sciences
Division of Public Health Sciences
Department of Biostatistical Sciences
Medical Center Boulevard
Winston-Salem, NC 27157-1063
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EDUCATION

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

2008 Ph.D. in Biostatistics
University of North Carolina, Chapel Hill, NC

ACADEMIC APPOINTMENTS

2008-present Assistant Professor (tenure-track)
Wake Forest University School of Medicine
Division of Public Health Sciences
Department of Biostatistical Sciences
Winston-Salem, NC

2008-present Affiliate
Maya Angelou Center for Health Equity
Wake Forest University School of Medicine
Winston-Salem, NC

2009-present Member
Laboratory for Complex Brain Networks (LCBN)
Wake Forest University School of Medicine
Winston-Salem, NC

2009-present Graduate Faculty
Wake Forest University
Winston-Salem, NC

2009-present Joint Appointment
Translational Science Institute
Wake Forest University School of Medicine
Winston-Salem, NC

2010-present Member
Center for Bioethics, Health, and Society
Wake Forest University
Winston-Salem, NC

EMPLOYMENT

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

PROFESSIONAL MEMBERSHIPS AND SERVICE

Present	Member, American Statistical Association
Present	Member, International Biometric Society
Present	Member, Organization for Human Brain Mapping
Present	Member, Statistics Without Borders
2010	Participant, ENAR Fostering Diversity in Biostatistics Workshop
2008	Panelist, ENAR Fostering Diversity in Biostatistics Workshop
2007-2008	Member, Minority Health Broadcast Committee
2001-2002	Senior Representative (Board Member) Harvard Society for Black Scientists and Engineers
1998-2002	Member, National Society for Black Engineers
1998-2001	Member, Harvard Japan Society

Grant Review Activities

2009	NIH, Challenge Grant Reviewer
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Referee

2010-2011	Frontiers in Human Neuroscience
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INSTITUTIONAL SERVICE

Division/Department Level

2011	Imaging Strategic Planning Committee (Chair), Department of Biostatistical Sciences
2011	Strategic Planning Committee, Department of Biostatistical Sciences
2010	Recruitment Committee, Department of Biostatistical Sciences
2010	Space Committee, Department of Biostatistical Sciences
2010	Staff Appreciation Committee, Department of Biostatistical Sciences
2010	Research Committee, Department of Biostatistical Sciences

2008-2010 Recruitment Committee, Department of Biostatistical Sciences,
Section on Statistical Genetics and Bioinformatics

School Level

2010-2011 Medical Student Research Program, Reviewer

2010 Medical Student Research Day, Judge

2009-present Research Committee, Maya Angelou Center for Health Equity

PROFESSIONAL DEVELOPMENT

2010-2011 SAMSI-Program on Complex Networks (Participant)

2010 NetSci-Network Science School and Conference (Attendee)

2010 Translational Research Academy, Translational Science Institute
Wake Forest University School of Medicine

2009 Workshop for Junior Researchers
International Biometric Society ENAR Meeting

2009 Short Course: Statistical Modeling and Analysis of Brain Imaging Data
International Biometric Society ENAR Meeting

2009 Roundtable: Statistics in Medical Imaging
International Biometric Society ENAR Meeting

HONORS AND AWARDS

2010-present Selected as a Translational Research Academy Scholar (Wake Forest University
School of Medicine)

2004-2006 Recognized in The Chancellor's List (Honoring America's Outstanding Graduate
Students)

2003-2006, Recipient of NICHD Grant for Population Studies,
2007-2008 Department of Biostatistics (Chirayath Suchindran),
University of North Carolina

2002-2007 Awarded Royster Fellowship/Merit Scholarship, Graduate School, University of
North Carolina

2002-2004 Awarded Fryer Fellowship/Merit Scholarship, Department of Biostatistics,
University of North Carolina

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| 2002-2003 | Awarded Julie Gatewood Latane Fellowship in Interdisciplinary Living |
| 1998-2002 | Awarded Virginia Power/Dominion Power Scholarship for Excellence in Mathematics and Engineering |
| 1998 | Awarded Scholarship from the National Action Council for Minorities in Engineering for Excellence in Mathematics and Engineering |

PROFESSIONAL INTERESTS

Network Analysis, Neuroimaging, Linear Model Theory and Application, Repeated Measures Analysis, Covariance Modeling, Cardiac Imaging, Health/Social Disparities

INVITED PRESENTATIONS

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.*

CONTRIBUTED PRESENTATIONS

Conference

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).

Non-Conference

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.*
5. **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 Department of Biostatistics, University of Alabama at Birmingham.*
6. **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 Department of Biostatistics, Bioinformatics, and Epidemiology, Medical University of South Carolina.*
7. **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 Department of Biostatistics and Bioinformatics, Duke University.*
8. **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 Department of Biostatistics, Virginia Commonwealth University.*
9. **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 Department of Biostatistical Sciences, Wake Forest University School of Medicine.*
10. **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 Medical Image Display and Analysis Group, Shape Statistics Meeting, University of North Carolina at Chapel Hill.*

11. **Simpson SL**, Edwards LJ, Muller KE, Styner MA (2008). Linear Models With a Generalized AR(1) Covariance Structure for Imaging Data. *Presented to the Neuroimaging Research Group, Neuroimaging Seminar Series, University of North Carolina at Chapel Hill.*
12. **Simpson SL**, Edwards LJ, Muller KE, Styner MA (2008). Linear Models With a Linear Exponent AR(1) Covariance Structure for Imaging Data. *Presented to the Advanced Neuroscience Imaging Research Laboratory, Wake Forest University School of Medicine.*
13. **Simpson SL** (2009). Exponential Random Graph Models. *Presented to the Laboratory for Complex Brain Networks, Wake Forest University.*
14. **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 University School of Medicine.*
15. **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 University School of Medicine.*
16. 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 University School of Biomedical Engineering and Sciences Research Symposium, Winston-Salem, NC.*
17. **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.*
18. **Simpson SL** (2010). Modeling Whole-Brain Networks: A Brief Overview of Challenges and Potential Solutions. *Presented to the Department of Biostatistical Sciences, Wake Forest University School of Medicine.*
19. 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.*
20. **Simpson SL** (2011). Modeling Whole-Brain Networks: A Brief Overview of Challenges and Potential Solutions. *Presented to the Translational Research Academy (TRAc), Wake Forest University School of Medicine.*

GRANTS ACTIVE AND PENDING

Active

(Carr)	11/15/2007 - 05/31/2012	10%
NHLBI	\$402,910	

Jackson Heart Study MRI

Role: Co-Investigator

(Simpson) 07/01/2010 - 06/30/2012 75%
Wake Forest University \$221,513
Translational Scholar Award
**Age-Related Whole-Brain Analyses via Exponential Random Graph
Modeling Methods**
Role: Principal Investigator

PAST GRANT HISTORY

(Carr) 09/01/2009 - 09/30/2009 7%
NHLBI \$308,135
The Coronary Artery Risk Development in Young Adults (Cardia)
Role: Biostatistician

BIBLIOGRAPHY

METHODOLOGICAL JOURNAL ARTICLES

1. Muller KE, Edwards LJ, **Simpson SL**, and 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, and **Simpson SL** (2009). POWERLIB: SAS/IML Software for Computing Power in Multivariate Linear Models. *Journal of Statistical Software* 30, 1-27.
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 (doi:10.1002/sim.3928).
4. **Simpson SL** (2010). An Adjusted Likelihood Ratio Test for Separability in Unbalanced Multivariate Repeated Measures Data. *Statistical Methodology* 7, 511-519 (doi:10.1016/j.stamet.2010.02.003).
5. **Simpson SL**, Edwards LJ (2011). A Circular LEAR Correlation Structure for Cyclical Longitudinal Data. *Statistical Methods in Medical Research*, (doi:10.1177/0962280210395741).
6. **Simpson SL**, Hayasaka S, Laurienti PJ (2011). Exponential Random Graph Modeling for Complex Brain Networks. *PLoS ONE*, *In Press*.

APPLICATIONS JOURNAL ARTICLES

7. Lark RK, Williams CL, Stadler D, **Simpson SL**, Henderson RC, Samson-Fang L, and Worley G (2005). Serum Prealbumin and Albumin Concentrations Do Not Reflect Nutritional State in Children With Cerebral Palsy. *Journal of Pediatrics* 147, 695-697.
8. Thomas KB, **Simpson SL**, Tarver WL, and 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.

9. 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.
10. Telesford Q, Morgan AR, Hayasaka S, **Simpson SL**, Barret W, Kraft RA, Mozolic JL, Laurienti P (2010). Reproducibility of graph metrics in fMRI Networks. *Frontiers in Neuroinformatics* 4, 117 (doi:10.3389/fninf.2010.00117).
11. Webb BC, **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 (doi:10.2105/AJPH.2009.171157).

OTHER PUBLICATIONS

1. **Simpson SL**, Edwards LJ, Muller KE, and 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. Edwards LJ, **Simpson SL**. Analysis of 24-Hour Ambulatory Blood Pressure Monitoring Data using Orthonormal Polynomials in the Linear Mixed Model. arXiv:1010.1224v1 [stat.AP].
4. **Simpson SL**, Edwards LJ, Muller KE, Styner MA (2010). A Kronecker Product Linear Exponent AR(1) Family of Correlation Structures for Multivariate Repeated Measures Data. arXiv:1010.4471v1 [stat.AP].
5. **Simpson SL**, Moussa MN, Laurienti PJ. An Exponential Random Graph Modeling Approach to Creating Group-Based Representative Whole-Brain Connectivity Networks. arXiv:1101.2592v1[stat.AP].

MANUSCRIPTS IN PREPARATION

1. **Simpson SL**, Edwards LJ, Muller KE, and Styner MA. Kronecker Product Linear Exponent AR(1) Correlation Structures and Separability Tests for Multivariate Repeated Measures Data. *In Process*.
2. Edwards LJ, **Simpson SL**. Analysis of 24-Hour Ambulatory Blood Pressure Monitoring Data using Orthonormal Polynomials in the Linear Mixed Model. *Submitted*.
3. **Simpson SL**, Moussa MN, Laurienti PJ. An Exponential Random Graph Modeling Approach to Creating Group-Based Representative Whole-Brain Connectivity Networks. *Submitted*.

4. Espeland MA, Dagenbach D, Jennings JM, Brunner RL, Resnick SM, Beavers D, **Simpson SL**, Coker LH, Gaussoin SA, Sink K, and Rapp SR. The Utility of Variability in Domain-Specific Cognitive Function in Predicting Incident Dementia: Evidence from the Women's Health Initiative Study of Cognitive Aging. *Submitted*.
5. Carr JJ, **Simpson SL**, Evans GW, Terry JG. Determinants of Coronary Artery Calcified Plaque in African Americans: The Jackson Heart Study. *In Process*.
6. Carr JJ, **Simpson SL**, Ge Y, Terry JG. Computed Tomography (CT) Methods in the Jackson Heart Study. *In Process*.
7. Carr JJ, **Simpson SL**, Entrikin D, Hundley G, Vitek T, Terry JG. Association of Sub-Clinical Coronary Artery Atherosclerosis with Left Ventricular Systolic Function: The Jackson Heart Study. *In Process*.
8. Carr JJ, **Simpson SL**, Ding J, Hundley G, Gordy B, Terry JG. Pericardial Adipose Tissue and Left Ventricular Systolic Function: The Jackson Heart Study and Multi-Ethnic Study of Atherosclerosis. *In Process*.
9. Terry JG, **Simpson SL**, Smith C, Hairston K, Ding J, Register T, Wojczynski M, Borecki IB. Association of Visceral Adipose Tissue with Calcification of The Coronary and Abdominal Aorta Arteries: The Family Heart Study. *In Process*.

TEACHING ACTIVITIES

- 2010 Co-teacher, Imaging Analysis Workshop, Jackson Heart Study Scientific Conference.
- 2010 Standardized Patient Assessment Exam Evaluator (8.6 hours)
Wake Forest University School of Medicine
Winston-Salem, NC
- 2009 CPTS 730 (Guest Lecturer-11/3)
Wake Forest University School of Medicine
Winston-Salem, NC
- 2009 Standardized Patient Assessment Exam Evaluator (5.4 hours)
Wake Forest University School of Medicine
Winston-Salem, NC
- 2007 Co-taught biostatistics short course to biomedical graduate students and post-docs.
University of North Carolina, Chapel Hill, NC
- 2004 Teaching Assistant
Survival and Categorical Data Analysis
Department of Biostatistics
University of North Carolina, Chapel Hill, NC

GRADUATE STUDENTS/RESIDENTS/FELLOWS ADVISED

- Current Dissertation Committee Member
 Student: Karen Joyce
 PhD student, Biomedical Engineering, Wake Forest University
 Wake Forest University School of Medicine
 Winston-Salem, NC
- 2009 Mentee: Bryant Cameron Webb
 Topic: Using a Health Disparities Index to Evaluate the Efficacy of Minority Health
 Legislation
 Maya Angelou Center for Health Equity
 Wake Forest University School of Medicine
 Winston-Salem, NC

COMMUNITY ACTIVITIES AND SERVICE

- 2000-2002 Dearborn Middle School Tutoring/Mentoring Program
 Boston, MA
- 2006-2008 Orange Correctional Community Volunteer
 Hillsborough, NC