## BIOGRAPHICAL SKETCH

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NAME: Dawson, Jeffrey

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

POSITION TITLE: Professor

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 |
|---|---|---|---|
| Brigham Young University, Provo, UT | B.S. | 1987 | Statistics (Mathematics) |
| Harvard University, Boston, MA | Sc.D. | 1991 | Biostatistics (Human Biology) |

### A. Personal Statement

In the Iowa Summer Institute in Biostatistics (ISIB), we introduce undergraduate students to biostatistics so then can decide whether to pursue a career in this field. I have been a mentor and lecturer in this ISIB program since its inception, drawing upon over 30 years of experience in teaching and research. With over 20 years of experience in the areas of cardiovascular research and driving studies of impaired populations, those are the areas wherein I provide lectures and direct student projects. As the first Director of Graduate Studies in our department (2003-2012), I am also able to share my perspective with the students to help them prepare for graduate school. Finally, I present students with an introduction to Scholarly Integrity in Biostatistics. Lists of my publications can be found at https://www.researchgate.net/profile/Jeffrey_Dawson2/publications and http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/50115148/?sort=date&direction=ascending.

### B. Positions and Honors

List in chronological order previous positions, concluding with the present position. List any honors. Include present membership on any Federal Government public advisory committee.

**Positions and Employment**

| | |
|---|---|
| 1985-87 | Research Assistant, Brigham Young University, Provo, UT |
| 1987-91 | Teaching Assistant, Harvard University, Boston, MA |
| 1988-89 | Research Assistant, Dana-Farber Cancer Institute and Harvard University, Boston, MA |
| 1991-97 | Assistant Professor, Department of Preventive Medicine & Environmental Health, University of Iowa, Iowa City, IA |
| 1997-99 | Associate Professor, Department of Preventive Medicine & Environmental Health, University of Iowa, Iowa City, IA |
| 1999-09 | Associate Professor, Department of Biostatistics, College of Public Health (established 1999), University of Iowa, Iowa City, IA |
| 2003-12 | Director of Graduate Studies, Department of Biostatistics, College of Public Health, University of Iowa, Iowa City, IA |
| 2009- | Professor, Department of Biostatistics, College of Public Health, University of Iowa, Iowa City, IA |
| 2011- | Associate Dean for Faculty Affairs, College of Public Health, University of Iowa, Iowa City, IA |

**Honors**

| | |
|---|---|
| 1987 | Phi Kappa Phi Honor Society |
| 1993 | University of Iowa College of Medicine Research Committee Award |

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|---|---|
| 1994 | Elected to Faculty Senate |
| 1999-01 | Faculty Mentor for Medical Science Training Program |
| 2004 | College of Public Health Faculty Service Award |
| 2008-09 | Chair of Faculty Council, College of Public Health, Univ. of Iowa |
| 2013 | Inducted into Delta Omega Honorary Society in Public Health |
| 2012-15 | American Statistical Association Council of Chapters Governing Board |
| 2013-14 | Academic Leadership Program Fellow, Committee on Institutional Cooperation |
| 2016 | Fellow, American Statistical Association |

**Professional Memberships**

American Statistical Association
International Biometric Society (ENAR)
International Association for Statistical Education (IASE)

**C. Contributions to Science**

**Driving Research in Neurologically-Impaired Populations:**

I have been part of a research team for 18 years that has been using driving simulators, instrumented vehicles, and "black box" technology to study the safety and performance of drivers with Alzheimer's disease, Parkinson's disease, strokes, and obstructive sleep apnea, as well as healthy elderly drivers. We have been able to quantify differences between the disease groups and healthy drivers, and have found off-road cognitive tests that correlate with driving measures and with driving cessation. We have published over 40 papers in this area. Selected references are:

Dawson JD, Anderson SW, Uc EY, Dastrup E, Rizzo M. (2009) Predictors of driving safety in early Alzheimer's disease. *Neurology, 72*(6), 521-527. PMID: 19204261

Dawson JD, Uc EY, Anderson SW, Johnson AM, Rizzo M. (2010) Neuropsychological predictors of driving errors in older adults. *Journal of the American Geriatrics Society, 58*(6), 1090-1096. PMC: PMC3204878, PMID: 20487082

Uc EY, Rizzo M, Johnson AM, Emerson JL, Liu D, Mills ED, Anderson SW, Dawson JD. (2011) Real-life driving outcomes in Parkinson disease *Neurology, 76*(22), 1894-1902. PMC: PMC3115811, PMID: 21624988

Aksan N, Dawson JD, Emerson J, Yu L, Uc EY, Anderson S, Rizzo M. (2013) Naturalistic distraction and driving safety in older drivers *Human Factors, 55*(4), 841-855. PMC: PMC3880225, PMID: 23964422

**Cardiovascular Health:**

I worked for several years in the adult phases of the Muscatine heart study, primarily in projects where we measured the intima medial thickness of carotid arteries and the abdominal aorta (cIMT and aIMT, respectively), which are surrogates for stroke and heart attack risk. We found that childhood cholesterol levels correlated with higher cIMT when measured decades later. We also found several cardiovascular risk factors that correlated with cIMT and aIMT in adolescents and young adults. I also work with collaborators in Pharmacy and Family Medicine to study issues related to the control of hypertension. We have demonstrated that certain types of collaboration between physicians and pharmacists can improve the management of high blood pressure. Overall, I have published 20 articles in the area of cardiovascular health. Examples include:

Davis PH, Dawson JD, Riley WA, Lauer RM. (2001) Carotid intimal-medial thickness is related to cardiovascular risk factors measured from childhood through middle-age: the Muscatine study. *Circulation, 104*, 2814-2819. PMID: 11733400

Dawson JD, Sonka M, Blecha MB, Lin W, Davis PH. (2009) Risk factors associated with aortic and carotid intimal-media thickness in adolescents and young adults: the Muscatine offspring study. Journal of the American College of Cardiology, 53(24), 2273-2279. PMID: 19520251

Carter BL, Ardery G, Dawson JD, James PA, Bergus GR, Doucette WR, Chrischilles EA, Franciscus CL, Xu Y. (2009) Physician and pharmacist collaboration to improve blood pressure control. Archives of Internal Medicine, 169(21), 1996-2002. PMID: 9933962

Carter BL, Levy BT, Gryzlak B, Chrischilles EA, Vander Weg MW, Christensen AJ, James PA, Moss CA, Parker CP, Gums T, Finkelstein RJ, Xu Y, Dawson JD, Polgreen LA (2015). A centralized cardiovascular risk service to improve guideline adherence in private primary care offices. Contemporary Clinical Trials, 43:25–32. PMCID: PMC4522340, PMID: 25952471.

**Longitudinal and Time Series Methodologies:**

Throughout my career, I have investigated ways of reducing the dimensionality of repeated measures longitudinal data in ways that are simple enough to understand, yet complex enough to capture the intricacies of the data. I have 11 publications in this area. In recent years, this interest has been focused on the high-frequency repeated measures (i.e., time series data) that are obtained in my driving research. We have developed a new model that quantifies the diligence with which drivers return the car back towards the middle of the lane as the car approaches the lane boundaries. Examples of my methodological papers are:

Dawson JD, Han SH. (2000) Stratified tests, stratified slopes, and random effects models for clinical trials with missing data. *Journal of Biopharmaceutical Statistics, 10*, 447-55. PMID: 11104386

Arndt S, Turvey C, Coryell WH, Dawson JD, Leon AC, Akiskal HS. (2000) Charting patients' course: a comparison of statistics used to summarize patient course in longitudinal and repeated measures studies. *Journal of Psychiatric Research, 34*, 105-113. PMID: 10758251

West CP, Dawson JD. (2002) Complete imputation of missing repeated categorical data: one-sample applications. Statistics in Medicine, 21(2), 203-217. PMID: 11782060

Dawson JD, Cavanaugh JE, Zamba KD, Rizzo M. (2010) Modeling lateral control in driving studies. Accident Analysis & Prevention, 42(3), 891-897. PMID: 20380917

**List of published work in NCBI MyBibliography:**
https://www.ncbi.nlm.nih.gov/myncbi/1zei9c5Qq6556/bibliography/public/

**D. Research Support**

**Ongoing Research**

R01 HD084645 (Shields, Richard) 05/15/15-01/31/22
NIH
Musculoskeletal Plasticity after Spinal Cord Injury
The long-term goal is to prevent the deleterious skeletal secondary complications that follow complete spinal cord injury (SCI). As many as twenty thousand Americans sustain an SCI each year, making it a public health concern of primary importance. Secondary complications from osteoporosis lead to bone fractures and renal complications that cost society between 4 and 7 billion dollars annually. A method to prevent bone loss after SCI would not only provide substantial savings, but could also profoundly improve the quality of life of people with SCI and keep them as viable candidates for the future cure.
Role: Co-Investigator

5 R01 HD082109 (Shields, Richard) 08/01/15-04/30/21
NIH
Long Duration Activity and Metabolic Control after Spinal Cord Injury

The long-term goal of this research is to develop a rehabilitation strategy to protect the musculoskeletal health, metabolic function, and health-related quality of life of people living with complete SCI.
Role: Co-Investigator

R01 CA215034 (Levy, Barcey) 08/01/17-07/31/22
NIH
Comparative Effectiveness of Fecal Immunochemical Tests with Optical Colonoscopy
Colorectal cancer (CRC) is the third most common cancer and the third leading cause of cancer death in both men and women in the U.S., with nearly 50,000 deaths each year. Fecal immunochemical tests (FITs) are a type of FOBT that can be a sensitive, specific, and low-cost alternative to colonoscopy for CRC screening. We propose to compare the test characteristics of three CLIA-waived FITs and two automated FITs, using colonoscopy as the gold standard. Our aims are: Aim 1: To assess the diagnostic accuracy for advanced colorectal neoplasms of three of the most commonly used CLIA-waived FITs and two automated FITs, using colonoscopy as the gold standard. Aim 2: To evaluate the diagnostic accuracy of two quantitative FITs using receiver operating characteristic (ROC) analysis. Aim 3: To assess factors associated with false positive and false negative FIT results for each device. These findings will provide essential information about FITs with the best test characteristics for future expanded use of FIT, critically important to achieving our long-term goal of reducing morbidity and mortality from CRC. FITs are more acceptable to patients, will allow higher screening rates, and will reduce costs as compared with a screening strategy based on colonoscopy as the primary initial screening method.
Role: Co-Investigator

R01 HL139918 (Kennelty, Korey) 02/01/18-01/31/23
NIH
Dissemination of the Cardiovascular Risk Service (CVRS Live)
We developed an innovative team-based intervention, the Cardiovascular Risk Service (CVRS), which includes a centralized, pharmacist-led cardiovascular risk service and prevention services (e.g., vaccinations, cancer screenings) model to support primary care providers with CVD management and achievement of key performance measures. Specific aims: Aim 1: Identify, understand, and develop strategies for overcoming barriers to the adoption, implementation, and maintenance of the CVRS in diverse primary care offices. Aim 2: Determine the real-world reach and effectiveness of the CVRS in diverse primary care offices. Aim 3: Determine CVRS sustainability and adaptation in diverse primary care offices.
Role: Co-Investigator

R25 HL147231 (Zamba, Gideon) 03/01/19-02/28/22
NIH
Iowa Summer Institute for Research Education in Biostatistics
This is a proposal to the National Institutes of Health (NIH), National Heart, Lung and Blood Institute (NHLBI), from the University of Iowa, in response to RFA-HL-19-019 for an Iowa Summer Institute for Research Education in Biostatistics (ISIREB), Summer Programs 2019, 2020, & 2021.
Role: Co-Investigator

VA IPA/I01RX002987 (Uc, Ergun) 07/01/19-07/31/
US Dept. of Veterans Affairs, Iowa City VAMC
VA IPA/Long Term Aerobic Exercise to Slow Progression in Parkinson's Disease
Dr. Dawson will serve as a Co-Investigator on this project and will take the lead in formal statistical analysis of study data. He will also advise protocols and procedures to support data quality and data safety monitoring. Hence, Dr. Dawson will play a key role in the intellectual development of the collection, management, and analysis of study data, as well as dissemination of project results in manuscripts and presentations at local/national/international meetings.
Role: Co-Investigator/PI of VA IPA

Contract #34-5250-2026-015 (Rizzo, Matthew) 06/01/20-02/28/21
University of Nebraska Medical Center

Monitoring Real-World Driver Behavior for Classification and Early Prediction of Alzheimer's Disease
This project tackles the NIA's 2019 grand challenge of using a person's own vehicle as a passive-detection system for flagging potential age- and/or disease-related aberrant driving that may signal early warning signs of functional decline and incipient Alzheimer's disease (AD), even before standard clinical tests. Aim 1: Extract key real-world driver behavior features over a 3-month continuous, baseline period that classify normally aging, MCI, and ACS drivers by NIA-AA core clinical criteria. Aim 2: Determine the extent to which real-world driver sleep and mobility factors, collected over a continuous, 3-month baseline period, mediate the relationship between extracted driver behavior and clinical features (described in Aim 1). Develop models (statistical and supervised machine learning) that combine extracted features of driver behavior (from Aim 1) and real-world sleep and mobility (SA2) to detect early signs of MCI and AD and predict disease progression.
Role: Subcontract PI

**Completed Research**

Contract #34-5250-2000-011 (Dawson, Jeffrey, contact PI) 07/01/13-05/31/18
University of Nebraska Medical Center (Aksan, Nazan, Rizzo, Matthew)
Predictions of Driver Safety in Advancing Age
Role: Contact PI
The specific aims of this project are: 1) To obtain a comprehensive picture of age-related changes in older drivers' abilities by following longitudinally a cohort of drivers over age 65, most of whom are currently enrolled in our research on predictions of driver safety, using (a) analysis of state records of crashes and moving violations, (b) detailed assessment of cognitive abilities, and (c) measurements of driving performance from a high-fidelity driving simulator and an instrumented vehicle; 2) To study a particularly high-risk group of older drivers (ages 65 and over) who, because of non-alcohol-related, at-fault crashes or moving violations, had their licenses suspended and reinstated or revoked in the past year, and evaluate their cognitive abilities (using neuropsychological tools) and driving performance (using the simulator); and 3) To determine which cognitive impairments contribute the most to driving errors and crashes, and to develop predictive models of driving.

5 R01 HL116311 (Carter, Barry) 08/08/13-07/31/18
NIH
Improved Cardiovascular Risk Reduction to Enhance Rural Primary Care: I-CARE Trial
Role: Co-Investigator
The contribution of the present study will be: 1) the development of an effective strategy to improve the management of CVD and preventive health services, and 2) to achieve key performance improvement measures using an efficient, centralized, web-based PHCVRS to support primary care providers.

5 R01 NS055903 (Nopolous, Peggy) 03/01/09-07/31/18
NIH
Growth and Development of the Striatum in Huntington's Disease
Role: Co-Investigator
This study measures the volume, function, and development of the striatum in children at risk for Huntington's Disease (HD). This competitive proposal will add: 1) evaluation of striatal resting state functional connectivity MRI (fcMRI), 2) Molecular measures of striatal integrity using (1)H magnetic resonance spectroscopy (MRS), and 3) the evaluation of developmental trajectories (growth between ages 6-18 years) of brain structure via an 'accelerated longitudinal' format.