BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Cavanaugh, Joseph E.	Professor
eRA COMMONS USER NAME	
CAVANAUGHJ	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Montana Tech	B.S.	1986	Mathematics
Montana Tech	B.S.	1986	Computer Science
Montana State University	M.S.	1988	Statistics
University of California, Davis	Ph.D.	1993	Statistics

A. Positions and Honors

Positions and Employment

1993-1998   Assistant Professor, Department of Statistics, University of Missouri-Columbia
1998-1999   Assistant Professor and Director of Graduate Studies,
                  Department of Statistics, University of Missouri-Columbia
1999-2000   Associate Professor, Department of Statistics, University of Missouri-Columbia
2000-2003   Associate Professor and Director of Undergraduate Studies,
                  Department of Statistics, University of Missouri-Columbia
2003-2008   Associate Professor, Department of Biostatistics, College of Public Health,
                  The University of Iowa
2003-2008   Associate Professor, Department of Statistics and Actuarial Science,
                  The University of Iowa (Secondary Appointment)
2008-   Professor, Department of Biostatistics, College of Public Health,
                  The University of Iowa
2008-   Professor, Department of Statistics and Actuarial Science,
                  The University of Iowa (Secondary Appointment)

Honors

1992   Teaching Award for Outstanding Graduate Students, University of California, Davis
1994   Montana Tech Alumni Recognition Award, Montana Tech
1997   Provost Outstanding Junior Faculty Teaching Award, University of Missouri-Columbia
1998   Gold Chalk Award (for the training & mentoring of graduate students),
        University of Missouri-Columbia
2000   William T. Kemper Fellowship for Excellence in Teaching,
        University of Missouri-Columbia
2006   College of Public Health Faculty Teaching Award, The University of Iowa

Professional Memberships

American Statistical Association
Institute of Mathematical Statistics
International Biometric Society
American Academy for the Advancement of Science

B. Selected peer-reviewed publications (in chronological order)

1. Huang Y, Palaniappan K, Zhuang X, and Cavanaugh JE. Optic flow field segmentation and motion estimation using a robust genetic partitioning algorithm. <u>IEEE Transactions on Pattern Analysis and Machine Intelligence</u> 17:1177-1190, 1995.
2. Cavanaugh JE and Shumway RH. On computing the expected Fisher information matrix for state-space model parameters. <u>Statistics & Probability Letters</u> 26:347-355, 1996.
3. Neath AA and Cavanaugh JE. Regression and time series model selection using variants of the Schwarz information criterion. <u>Communications in Statistics - Theory and Methods</u> 26:559-580, 1997.
4. Cavanaugh JE and Shumway RH. A bootstrap variant of AIC for state-space model selection. <u>Statistica Sinica</u> 7:473-496, 1997.
5. Cavanaugh JE. Unifying the derivations of the Akaike and corrected Akaike information criteria. <u>Statistics & Probability Letters</u> 33:201-208, 1997.
6. Bradley JS, Phillips JO, Cavanaugh JE, and Metzler MH. The clinical utility of pH paper versus pH meter in the measurement of critical gastric pH in stress ulcer prophylaxis. <u>Critical Care Medicine</u> 26:1905-1909, 1998.
7. Cavanaugh JE and Shumway RH. An Akaike information criterion for model selection in the presence of incomplete data. <u>Journal of Statistical Planning and Inference</u> 67:45-65, 1998.
8. Cavanaugh JE and Neath AA. Generalizing the derivation of the Schwarz information criterion. <u>Communications in Statistics -Theory and Methods</u> 28:49-66, 1999.
9. Cavanaugh JE. A large-sample model selection criterion based on Kullback's symmetric divergence. <u>Statistics & Probability Letters</u> 44:333-344, 1999.
10. Cavanaugh JE and Johnson WO. Assessing the predictive influence of cases in a state-space process. <u>Biometrika</u> 86:183-190, 1999.
11. Neath AA and Cavanaugh JE. A regression model selection criterion based on bootstrap bumping for use with resistant fitting. <u>Computational Statistics and Data Analysis</u> 35:155-169, 2000.
12. Wang Y, Cavanaugh JE, and Song C. Self-similarity index estimation via wavelets for locally self-similar processes. <u>Journal of Statistical Planning and Inference</u> 99:91-110, 2001.
13. Cavanaugh JE and Oleson JJ. A diagnostic for assessing the influence of cases on the prediction of missing data. <u>Journal of the Royal Statistical Society, Series D</u> 50:427-440, 2001.
14. Cavanaugh JE, Wang Y, and Davis JW. Locally self-similar processes and their wavelet analysis. *In* <u>Handbook of Statistics, Vol. 21, Stochastic Processes: Modeling and Simulation</u>, edited by DN Shanbhag and CR Rao, pp. 93-135. Elsevier Science, Amsterdam, The Netherlands, 2003.
15. Cavanaugh JE. Criteria for linear model selection based on Kullback's symmetric divergence. <u>Australian and New Zealand Journal of Statistics</u> 46:257-274, 2004.
16. Ferguson AC, Davis CH, and Cavanaugh JE.   An autoregressive model for analysis of ice sheet elevation change time series. <u>IEEE Transactions on Geoscience and Remote Sensing</u> 42:2426-2436, 2004.
17. Cavanaugh JE and Shang J. A diagnostic for assessing the influence of cases on the prediction of random effects in a mixed model. <u>Journal of Data Science</u> 3:137-151, 2005.
18. Kim HJ and Cavanaugh JE. Model selection criteria based on Kullback information measures for nonlinear regression. <u>Journal of Statistical Planning and Inference</u> 134:332-349, 2005.
19. Davies SL, Neath AA, and Cavanaugh JE. Cross-validation model selection criteria for linear regression based on the Kullback-Leibler discrepancy. <u>Statistical Methodology</u> 2:249-266, 2005.
20. Neath AA and Cavanaugh JE. A Bayesian approach to the multiple comparisons problem. <u>Journal of Data Science</u> 4:131-146, 2006.
21. Bengtsson T and Cavanaugh JE. An improved Akaike information criterion for state-space model selection. <u>Computational Statistics and Data Analysis</u> 50:2635-2654, 2006.

22. Davies SL, Neath AA, and Cavanaugh, JE. Estimation optimality of corrected AIC and modified Cp in linear regression. <u>International Statistical Review</u> 74:161-168, 2006.

23. Hong L, Levy SM, Warren JJ, Broffit B, and Cavanaugh J. Fluoride intake levels in relation to fluorosis development in maxillary central incisors and first molars. <u>Caries Research</u> 40:494-500, 2006.

24. Neath AA and Cavanaugh JE. Bayesian estimation of linear statistical model bias. <u>International Journal of Pure and Applied Mathematics</u> 32:255-264, 2006.

25. Polgreen PM, Chen YY, Cavanaugh JE, Ward M, Coffman S, Hornick DB, Diekema DJ, and Herwaldt LA. An outbreak of severe *Clostridium difficile*-associated disease possibly related to inappropriate antimicrobial therapy for community-acquired pneumonia. <u>Infection Control and Hospital Epidemiology</u> 28:212-214, 2007.

26. Tiesman H, Zwerling C, Peek-Asa C, Sprince N, Warner M, Fingerhut LA, and Cavanaugh JE. Nonfatal injuries among urban and rural residents: The National Health Interview Survey, 1997-2001. <u>Injury Prevention</u> 13:115-199, 2007.

27. Lu X, Pingel LC, Burnell KK, Cavanaugh JE and Brogden KA. Carbamoylcholine chloride induces a rapid elevated IL-6 response in the nasal cavity of C57BL/6 mice. <u>Comparative Medicine</u> 57:350-355, 2007.

28. Broffitt B, Levy SM, Warren JJ and Cavanaugh JE. An investigation of bottled water use and caries in the mixed dentition. <u>Journal of Public Health Dentistry</u> 67:151-158, 2007.

29. Kuntz JL, Cavanaugh JE, Becker LK, Ward MA, Appelgate DM, Herwaldt LA and Polgreen PM. *Clostridium difficile*-associated disease among patients in a small rural hospital. <u>Infection Control and Hospital Epidemiology</u> 28:1236-1239, 2007.

30. Fethke NB, Anton DC, Cavanaugh JE, Gerr F and Cook TM. Bootstrap exploration of surface electromyography sampling duration and exposure estimate precision. <u>Scandinavian Journal of Work, Environment & Health</u> 33:358-367, 2007.

31. Cavanaugh JE, Davies SL and Neath AA. Discrepancy-based model selection criteria using cross validation. *In* <u>Statistical Models and Methods for Biomedical and Technical Systems</u>, edited by F. Vonta, M. Nikulin, N. Limnios and C. Huber, pp. 477-490. Birkhauser, Boston, Massachusetts, 2008.

32. Bengtsson T and Cavanaugh JE. State-space discrimination and clustering of atmospheric time series data based on Kullback information measures. <u>Environmetrics</u> 19:103-121, 2008.

33. Polgreen PM, Chen Y, Beekmann S, Srinivasan A, Neill MA, Gay T and Cavanaugh JE. Elements of influenza vaccination programs that predict higher vaccination rates: Results of an Emerging Infections Network survey. <u>Clinical Infectious Diseases</u> 46:14-19, 2008.

34. Kuntz JL, Holley S, Helms CM, Cavanaugh JE, Vande Berg J, Herwaldt LA and Polgreen PM. Use of a pandemic preparedness drill to increase influenza vaccination among healthcare workers. <u>Infection Control and Hospital Epidemiology</u> 29:111-115, 2008.

35. Polgreen PM, Bohnett LC, Cavanaugh JE, Gingerich SB, Desjardin LE, Harris ML, Quinlisk MP and Pentella MA. The duration of mumps shedding after the onset of symptoms (with editorial commentary). <u>Clinical Infectious Diseases</u> 46:1447-1451, 2008.

36. Shang J and Cavanaugh JE. Bootstrap variants of the Akaike information criterion for mixed model selection. <u>Computational Statistics and Data Analysis</u> 52:2004-2021, 2008.

37. Shang J and Cavanaugh JE. An assumption for the development of bootstrap variants of the Akaike information criterion in mixed models. <u>Statistics & Probability Letters</u> 78:1422–1429, 2008.

38. Polgreen PM, Septimus EJ, Parry MF, Beekman SE, Cavanaugh JE, Srinivasan A and Talbot TR. Relationship of influenza vaccination declination statements and influenza vaccination rates for healthcare workers in 22 US hospitals. <u>Infection Control and Hospital Epidemiology</u> 29:675-677, 2008.

39. Shang J, Cavanaugh JE, and Wright FT. A Bayesian multiple comparison procedure for order-restricted mixed models. <u>International Statistical Review</u> 76:268-284, 2008.

C. Research Support

Ongoing Research Support

1/20/06-7/31/12

R49 CD001167-01 (PI: Peek-Asa, Corinne)
CDC
Iowa Injury Prevention Research Center
Specific aims: To control and prevent injuries, especially in rural communities, focusing on high-risk populations such as children, the elderly, farmers, and those with disabilities, through interdisciplinary research, outreach and training, targeting a wide variety of unintentional injuries.
Role: Co-Investigator

R49 CD001167-02 (PI: Hartley, Carolyn)   8/1/07-7/31/12
CDC
Iowa Injury Prevention Research Center
Specific aims: To evaluate the use of Batter Education Programs in Iowa, focusing in particular on the effects of sanctions as an incentive for batterer compliance with treatment and subsequent reduction in repeat domestic abuse offenses.
Role: Co-Investigator

R49 CE000947 (PI: Peek-Asa, Corinne)   9/1/07-9/29/09
CDC
Parent-Based Intervention to Increase Safe Teen Driving
Specific aims: To conduct a randomized trial of an educational intervention for parents of newly licensed adolescent drivers to increase parental involvement in teaching driving skills and safe driving behavior.
Role: Co-Investigator

R01 CA122934 (PI: Schultz, Susan)   6/5/07-4/30/12
NIH
Elderly Cancer Survivors: Cognitive Outcomes and Markers of Neuroegeneration
Specific aims: This study will examine long-term breast cancer survivors who have previously undergone chemotherapy treatment. It will specifically examine women in later life to determine if the chemotherapy may have latent effects on brain function. Brain imaging, genetic testing, and laboratory measures of DNA damage will be included in the analyses.
Role: Co-Investigator

R01 DE009551 (PI: Levy, Steven)   7/1/07-6/30/09
NIH
Longitudinal Study of Fluoride, Diet, Caries and Fluorosis
Specific aims: To examine the effects of fluoride and diet on the development of caries and fluorosis in a cohort of Iowa children.
Role: Co-Investigator

Pfizer, Inc. (PI: Polgreen, Philip)   9/1/08-6/30/10
Optimizing Influenza Surveillance in a Rural State
Specific aims: To optimize influenza surveillance using maximal coverage models and simulations.
Role: Co-Investigator

Pending