

# JOSEPH E. CAVANAUGH

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## EDUCATION

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Ph.D.	Statistics	University of California, Davis	1993	(GPA: 3.98/4.00)
M.S.	Statistics	Montana State University	1988	(GPA: 4.00/4.00)
B.S.	Computer Science	Montana Tech	1986	(GPA: 3.99/4.00)
B.S.	Mathematics	Montana Tech	1986	(GPA: 3.99/4.00)

## CURRENT POSITION AND APPOINTMENTS

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- Departmental Executive Officer, Department of Biostatistics, College of Public Health, University of Iowa;  
December, 2015 – present
- Professor of Biostatistics, College of Public Health;  
August, 2008 – present
  - Professor of Statistics and Actuarial Science, College of Liberal Arts and Sciences;  
August, 2008 – present
  - Professor of Applied Mathematical and Computational Sciences, Graduate College;  
August, 2014 – present
  - Professor of Biostatistics and Computational Biology, College of Dentistry;  
June, 2018 – present

## PREVIOUS POSITIONS AND APPOINTMENTS

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- November, 2014 – December, 2015 Professor of Biostatistics;  
Professor of Statistics and Actuarial Science;  
Professor of Applied Mathematical and Computational Sciences;  
Interim Departmental Executive Officer in Biostatistics;  
Director of Graduate Studies in Biostatistics;  
University of Iowa
- August, 2014 – November, 2014 Professor of Biostatistics;  
Professor of Statistics and Actuarial Science;  
Professor of Applied Mathematical and Computational Sciences;  
Director of Graduate Studies in Biostatistics;  
University of Iowa

July, 2012 – August, 2014	Professor of Biostatistics; Professor of Statistics and Actuarial Science; Director of Graduate Studies in Biostatistics; University of Iowa
August, 2008 – July, 2012	Professor of Biostatistics; Professor of Statistics and Actuarial Science; University of Iowa
August, 2003 – August, 2008	Associate Professor of Biostatistics; Associate Professor of Statistics and Actuarial Science; University of Iowa
September, 2000 – August, 2003	Associate Professor of Statistics; Director of Undergraduate Studies in Statistics; University of Missouri
September, 1999 – September, 2000	Associate Professor of Statistics; University of Missouri
September, 1998 – September, 1999	Assistant Professor of Statistics; Director of Graduate Studies in Statistics; University of Missouri
September, 1993 – September, 1998	Assistant Professor of Statistics; University of Missouri

#### AWARDS FOR PROFESSIONAL AND ACADEMIC ACHIEVEMENT

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- College of Public Health Distinguished Faculty Lecturer, 2022.
- Elected Member of the International Statistical Institute, 2019.
- Hancher-Finkbine Medallion (for leadership, learning, and loyalty), University of Iowa, 2017.
- Elected Fellow of the American Statistical Association, 2014.
- Montana Tech Chancellor's Medallion (for excellence in an academic career), 2013.
- College of Public Health Faculty Service Award, University of Iowa, 2013.
- Montana Tech Alumni Recognition Award, 1994.
- Valedictorian, Montana Tech graduating class of 1986.
- Highest Scholastic Standing in the Arts and Sciences, Montana Tech graduating class of 1986.

#### AWARDS FOR TEACHING, ADVISING, AND MENTORING

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- College of Public Health Faculty Mentor Award, University of Iowa, 2019.
- College of Public Health Faculty Teaching Award, University of Iowa, 2006.
- William T. Kemper Fellowship for Excellence in Teaching, University of Missouri, 2000.  
(\$10,000 award)
- Gold Chalk Award (for graduate student training and mentoring), University of Missouri, 1998.
- Provost Outstanding Junior Faculty Teaching Award, University of Missouri, 1997.
- Teaching Award for Outstanding Graduate Students, University of California, Davis, 1992.

## AWARDS FOR RESEARCH

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- Co-recipient (with R. A. Peterson) of the 2020 Best Paper Prize from the *Journal of Applied Statistics*: Ordered quantile normalization: a semiparametric transformation built for the cross-validation era.
- Co-recipient of the University of Iowa Carver College of Medicine Award for Best Clinical Paper of 2020: Cystic fibrosis carriers are at increased risk for a wide range of cystic fibrosis-related conditions, published in the *Proceedings of the National Academy of Sciences*,
- Recipient of a 2008 SPES Outstanding Presentation Award by the American Statistical Association Section on Physical and Engineering Sciences. Paper: State-space discrimination and clustering of atmospheric time series data based on Kullback information measures (with T. Bengtsson).
- Served as the Eugene Lukacs Visiting Professor of Statistics in the Department of Mathematics and Statistics at Bowling Green State University (March, 2008).
- Recipient of a 2001 SPES Outstanding Presentation Award by the American Statistical Association Section on Physical and Engineering Sciences. Paper: Self-similarity index estimation via wavelets for locally self-similar processes (with Y. Wang and C. Song).

## COURSES INSTRUCTED

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Course Title	Institution	Terms Instructed
Advanced Biostatistics Seminar: Model Selection	University of Iowa	8
Advanced Biostatistics Seminar: Generalized Linear Models	University of Iowa	2
Categorical Data Analysis	University of Iowa	10
Biostatistical Methods I	University of Iowa	2
Introduction to Biostatistics	University of Iowa	3 <sup>†</sup>
Seminar in Clinical and Translational Research	University of Iowa	2 <sup>*</sup>
Advanced Linear Models	University of Missouri	4
Linear Models I	University of Missouri	5
Linear Models II	University of Missouri	5
Applied Time Series Analysis	University of Missouri	2
Categorical Data Analysis	University of Missouri	3
Introduction to Mathematical Statistics	University of Missouri	3
Statistical Analysis	University of Missouri	4
Statistical Methods in Natural Resources	University of Missouri	4
Elementary Statistics (Honors)	University of Missouri	4
Regression Analysis	University of California, Davis	1
Probability Modeling and Statistical Inference	University of California, Davis	2
Elementary Statistics	University of California, Davis	10 <sup>‡</sup>
Elementary Statistics	Montana State University	5
Linear Algebra for Business	Montana State University	1
Survey of Calculus	Montana State University	1

<sup>†</sup> Instructed large lecture sections (> 75 students).

<sup>‡</sup> Instructed large lecture sections (> 200 students) for 7 out of 10 terms.

<sup>\*</sup> Served as co-instructor.

## METHODOLOGICAL DISCIPLINARY RESEARCH INTERESTS

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Model Selection

Variable Selection

Time Series Analysis

Modeling Diagnostics

## APPLIED INTERDISCIPLINARY RESEARCH INTERESTS

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Epidemiology

Infectious Diseases

Injury Prevention

Dentistry

## REFEREED PUBLICATIONS

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- Dajles, A. and Cavanaugh J. (2022). Probabilistic pairwise model comparisons based on bootstrap estimators of the Kullback–Leibler discrepancy. *Entropy*, **24**:1483, doi.org/10.3390/e2410148.
- Burghardt, E., Sewell, D. and Cavanaugh, J. (2022). Agglomerative and divisive hierarchical Bayesian clustering. *Computational Statistics and Data Analysis*, **176**:107566, doi.org/10.1016/j.csda.2022.107566.
- Koeneman, S. H. and Cavanaugh, J. E. (2022). An improved asymptotic test for the Jaccard similarity index for binary data. *Statistics & Probability Letters*, **184**:109375, doi.org/10.1016/j.spl.2022.109375.
- Miller, A. C., Arakkal, A. T., Koeneman, S. H., Cavanaugh, J. E. and Polgreen, P. M. (2022). A clinically–guided unsupervised clustering approach to recommend symptoms of disease associated with diagnostic opportunities. To appear in *Diagnosis*; available online at <https://doi.org/10.1515/dx-2022-0044>.
- Miller, A. C., Arakkal, A. T., Koeneman, S. H., Cavanaugh, J. E., Thompson G. R., Baddley, J. W. and Polgreen, P. M. (2022). Frequency and duration of, and risk factors for, diagnostic delays associated with histoplasmosis. *Journal of Fungi*, **8**:438, doi.org/10.3390/jof8050438.
- Erickson, B. A., Miller, A. C., Warner, H. L., Drobish, J. N., Koeneman, S. H., Cavanaugh, J. E. and Polgreen, P. M. (2022). Understanding the prodromal period of necrotizing soft tissue infections of the genitalia (Fournier’s gangrene) and the incidence, duration, and risk factors associated with potential missed opportunities for an earlier diagnosis: A population–based longitudinal study. *The Journal of Urology*, **208**, 1259–1267. (doi:10.1097/JU.0000000000002920)
- Miller, A. C., Harris, L. M., Cavanaugh, J. E., Alaiwa, M. A., Stoltz, D. A., Hornick, D. B. and Polgreen P. M. (2022). The rapid reduction of infection-related visits and antibiotic use among people with cystic fibrosis after starting Elexacaftor–Tezacaftor–Ivacaftor. *Clinical Infectious Diseases*, **75**, 1115–1122. (doi.org/10.1093/cid/ciac117)
- Simmering, J. E., Polgreen, L. A., Talan, D. A., Cavanaugh, J. E. and Polgreen P. M. (2022). Association of appendicitis incidence with warmer weather independent of season. *JAMA Open Network*, **5**:e2234269, doi:10.1001/jamanetworkopen.2022.34269.
- Hamann, C., Wendt, L., Davis, J., Peek–Asa, C., Jansson, S. and Cavanaugh, J. (2022). Should we throw the book at ‘em? Charge combinations and conviction rates among alcohol-influenced drivers involved in motorcycle crashes. To appear in *Journal of Safety Research*; available online after publication at <https://doi.org/10.1016/j.jsr.2022.09.003>.

- Faust, K., Casteel, C., Gerr, F., Cavanaugh, J. E., Boonstra, D. E., Anthony, T. R., Soupene, V. A. and Ramirez, M. (2022). Development of a checklist to identify injury hazards on row crop farms in the midwestern United States. To appear in *Journal of Agricultural Safety and Health*; available online after publication at <https://doi:10.13031/jash.15269>.
- Marshall, T. A., Curtis, A. M., Cavanaugh, J. E., Warren, J. J. and Levy, S. M. (2022). Associations between body mass index and body composition measures in a birth cohort. *Pediatric Research*, **91**, 1606–1615. (doi:10.1038/s41390-021-01562-y)
- Ramirez, M. R., Flores, J. E., Cheng, G., Peek–Asa, C. and Cavanaugh, J. E. (2021). Approach to analysing correlated contextual factors: an application for studies on violence. *Injury Prevention*, **27**, 161–165. (doi:10.1136/injuryprev-2020-043967)
- Ramirez, M. R., Flores, J. E., Woods–Jaeger, B., Cavanaugh, J. E., Peek–Asa, C., Branch, C., Bolenbaugh, M., Chande, V., Pitcher, G., Ortega, H. W., Randell, K. A., Wetjen, K., Roth, L. and Kenardy J. (2021). Comparative effectiveness of parent-based interventions to support injured children. *Pediatrics*, **148**:e2020046920, doi:10.1542/peds.2020-046920.
- Miller, A. C., Arakkal, A. T., Koeneman, S., Cavanaugh, J. E., Gerke, A. K., Hornick, D. B. and Polgreen P. M. (2021). Incidence, duration and risk factors associated with delayed and missed diagnostic opportunities related to tuberculosis: a population–based longitudinal study. *BMJ Open*, **11**:e045605, doi:10.1136/bmjopen-2020-045605.
- Miller, A. C., Koeneman, S. H., Arakkal, A. T., Cavanaugh, J. E. and Polgreen P. M. (2021). Incidence, duration, and risk factors associated with missed opportunities to diagnose herpes simplex encephalitis: a population–based longitudinal study. *Open Forum Infectious Diseases*, **8**:ofab400, doi.org/10.1093/ofid/ofab400.
- Simmering, J. E., Polgreen, L. A., Cavanaugh, J. E., Erickson, B. A., Suneja, M. and Polgreen P. M. (2021). Warmer weather and the risk of urinary tract infections in women. *The Journal of Urology*, **205**, 500–506. (doi.org/10.1097/JU.0000000000001383)
- Francis, S. L., Simmering, J. E., Polgreen, L. A., Evans, N. J., Hosteng, K. R., Carr, L. J., Cremer, J. F., Coe, S., Cavanaugh, J. E., Segre, A. M. and Polgreen, P. M. (2021). Gamifying accelerometer use increases physical activity levels of individuals pre-disposed to type II diabetes. *Preventive Medicine Reports*, **23**:101426, doi:10.1016/j.pmedr.2021.101426.
- Jovanovic, N., Peek–Asa, C., Zhang, L., Cavanaugh, J. E., Pidro, A. and Alajbegovic–Halimic, J. (2021). The risk and protective factors for pediatric eye injuries: A case–crossover study. *Ophthalmic Epidemiology*, **28**, 479–487. (doi:10.1080/09286586.2021.1877731)
- Baidwan, N. K., Ramirez, M. R., Gerr, F., Boonstra, D., Cavanaugh, J. E. and Casteel, C. (2021). Cost, severity and prevalence of agricultural-related injury workers’ compensation claims in farming operations from 14 U.S. states. *International Journal of Environmental Research and Public Health*, **18**:4309, doi:10.3390/ijerph18084309.
- Marshall, T. A., Curtis, A. M., Cavanaugh, J. E., Warren, J. J. and Levy, S. M. (2021). Beverage intakes and toothbrushing during childhood are associated with caries at age 17 years. *Journal of the Academy of Nutrition and Dietetics*, **121**, 253–260. (doi.org/10.1016/j.jand.2020.08.087)

- Riedle, B., Neath, A. A. and Cavanaugh, J. E. (2020). Reconceptualizing the  $p$ -value from a likelihood ratio test: a probabilistic pairwise comparison of models based on Kullback–Leibler discrepancy measures. *Journal of Applied Statistics*, **47**, 2582–2609. (doi:10.1080/02664763.2020.1754360)
- Carter, K. D. and Cavanaugh, J. E. (2020). Best–subset model selection based on multitudinal assessments of likelihood improvements. *Journal of Applied Statistics*, **47**, 2384–2420. (doi:10.1080/02664763.2019.1645097)
- Peterson, R. A. and Cavanaugh, J. E. (2020). Ordered quantile normalization: a semiparametric transformation built for the cross–validation era. *Journal of Applied Statistics*, **47**, 2312–2327. (doi:10.1080/02664763.2019.1630372)
- Miller, A. C., Comellas, A. P., Hornick, D. B., Stoltz, D. A., Cavanaugh, J. E., Gerke, A. K., Welsh, M. J., Zabner, J. and Polgreen, P. M. (2020). Cystic fibrosis carriers are at increased risk for a wide range of cystic fibrosis–related conditions. *Proceedings of the National Academy of Sciences*, **117**, 1621–1627. (doi:10.1073/pnas.1914912117)
- Singh, S., Hornick, D., Fedler, J., Launspach, J. L., Teresi, M. E., Santacrose, T. R., Cavanaugh, J. E., Horan, R., Nelson, G., Starner, T. D., Zabner, J. and Durairaj, L. (2020). Randomized controlled study of aerosolized hypertonic xylitol versus hypertonic saline in hospitalized patients with pulmonary exacerbation of cystic fibrosis. *Journal of Cystic Fibrosis*, **19**, 108–113. (doi:10.1016/j.jcf.2019.06.016)
- Marshall, T.A., Curtis, A. M., Cavanaugh, J. E., Warren, J. J. and Levy, S. M. (2020). Identification of and associations among low, middle, and high body composition trajectories from age 5– to 17–years. *Children*, **7**:192, doi:10.3390/children7100192.
- Curtis, A. M., Levy, S. M., Cavanaugh, J. E., Warren, J. J., Kolker, J. L. and Weber–Gasparoni, K. (2020). Decline in dental fluorosis severity during adolescence: A cohort study. *Journal of Dental Research*, **99**, 388–394. (doi:10.1177/0022034520906089)
- Cavanaugh, J. E. and Neath, A. A. (2019). The Akaike information criterion: Background, derivation, properties, application, interpretation, and refinements. *WIREs Computational Statistics*, **11**:e1460, doi:10.1002/wics.1460.
- Ranapurwala, S. I., Cavanaugh, J. E., Young, T., Wu, H., Peek–Asa, C. and Ramirez, M. R. (2019). Public health application of predictive modeling: an example from farm vehicle crashes. *Injury Epidemiology*, **6**:31, doi:10.1186/s40621-019-0208-9.
- Peek–Asa, C., Reyes, M. L., Hamann, C. J., Butcher, B. D. and Cavanaugh, J. E. (2019). A randomized trial to test the impact of parent communication on improving in–vehicle feedback systems. *Accident Analysis & Prevention*, **131**, 63–69. (doi:10.1016/j.aap.2019.06.006)
- Zahr, R. S., Anthony, C. A., Polgreen, P. M., Simmering, J. E., Goerdts, C. J., Hoth, A. B., Miller, M. L., Suneja, M., Segre, A. M., Carter, B. L., Cavanaugh, J. E. and Polgreen, L. A. (2019). A texting–based blood pressure surveillance intervention. *Journal of Clinical Hypertension*, **21**, 1463–1470. (doi:10.1111/jch.13674)

- Marshall, T. A., Curtis, A. M., Cavanaugh, J. E., Warren, J. J. and Levy, S. M. (2019). Child and adolescent sugar-sweetened beverage intakes are longitudinally associated with higher body mass index  $z$  scores in a birth cohort followed 17 years. *Journal of the Academy of Nutrition and Dietetics*, **119**, 425–434. (doi:10.1016/j.jand.2018.11.003)
- Liao, J. G., Cavanaugh, J. E. and McMurry, T. L. (2018). Extending AIC to best subset regression. *Computational Statistics*, **33**, 787–806. (doi:10.1007/s00180-018-0797-8)
- Ten Eyck, P. and Cavanaugh, J. E. (2018). Model selection criteria based on cross-validated concordance statistics. *Computational Statistics*, **33**, 595–621. (doi:10.1007/s00180-017-0766-7)
- Ten Eyck, P. and Cavanaugh, J. E. (2018). An alternate approach to pseudo-likelihood model selection in the generalized linear mixed modeling framework. *Sankhyā B: The Indian Journal of Statistics*, **80-B**, 98–122. (doi:10.1007/s13571-017-0130-5)
- Tang, F. and Cavanaugh, J. E. (2018). State-space models for binomial time series with excess zeros. In *Time Series and Applications*, edited by N. Mohamudally, 127–151. InTechOpen, London, United Kingdom. (doi:10.5772/intechopen.71336)
- Simmering, J. E., Cavanaugh, J. E., Polgreen, L. A. and Polgreen P. M. (2018). Warmer weather as a risk factor for hospitalisations due to urinary tract infections. *Epidemiology and Infection*, **146**, 386–393. (doi:10.1017/S0950268817002965)
- Polgreen, L. A., Riedle, B. N., Cavanaugh, J. E., Girotra, S., London, B., Schroeder, M. C. and Polgreen, P. M. (2018). Estimated cardiac risk associated with macrolides and fluoroquinolones decreases substantially when adjusting for patient characteristics and comorbidities. *Journal of the American Heart Association*, **7**:e008074, doi:10.1161/JAHA.117.008074.
- Marshall, T. A., Curtis, A. M., Cavanaugh, J. E., Warren J. J. and Levy, S. M. (2018). Higher longitudinal milk intakes are associated with increased height in a birth cohort followed for 17 years. *The Journal of Nutrition*, **148**, 1144–1149. (doi:org/10.1093/jn/nxy071)
- Marshall, T. A., Curtis, A. M., Cavanaugh, J. E., VanBuren, J., Warren J. J. and Levy, S. M. (2018). Description of child and adolescent beverage and anthropometric measures according to adolescent beverage patterns. *Nutrition*, **10**, 958, doi:10.3390/nu10080958.
- Curtis, A. M., VanBuren, J., Cavanaugh, J. E., Warren J. J., Marshall, T. A. and Levy, S. M. (2018). Longitudinal associations between dental caries increment and risk factors in late childhood and adolescence. *Journal of Public Health Dentistry*, **78**, 321–328. (doi:10.1111/jphd.12275)
- Curtis, A. M., Cavanaugh, J. E., Levy, S. M., VanBuren, J., Marshall, T. A. and Warren J. J. (2018). Examining caries aetiology in adolescence with structural equation modelling. *Community Dentistry and Oral Epidemiology*, **46**, 258–264. (doi:10.1111/cdoe.12359)
- Ghazal, T., Levy, S. M., Childers, N., Carter, K., Caplan, D., Warren, J., Cavanaugh, J. and Kolker J. (2018). *Mutans streptococci* and dental caries: A new statistical modeling approach. *Caries Research*, **52**, 246–252. (doi:10.1159/000486103)
- Neath, A. A., Flores, J. E. and Cavanaugh J. E. (2017). Bayesian multiple comparisons and model selection. *WIREs Computational Statistics*, **10**:e1420, doi:10.1002/wics.1420.

- Oleson, J. J., Cavanaugh, J. E., McMurray, B. and Brown, G. (2017). Detecting time-specific differences between temporal nonlinear curves: Analyzing data from the visual world paradigm. *Statistical Methods in Medical Research*, **26**, 2708–2725. (doi:10.1177/0962280215607411).
- VanBuren, J., Cavanaugh, J., Marshall, T., Warren J. and Levy S. M. (2017). AIC identifies optimal representation of longitudinal dietary variables. *Journal of Public Health Dentistry*, **77**, 360–371. (doi:10.1111/jphd.12220)
- Marshall, T. A., VanBuren, J. M., Warren, J. J., Cavanaugh, J. E. and Levy, S. M. (2017). Beverage consumption patterns at age 13 to 17 years are associated with weight, height, and body mass index at age 17 years. *Journal of the Academy of Nutrition and Dietetics*, **117**, 698–706. (doi:10.1016/j.jand.2017.01.010)
- Warren, J. J., VanBuren, J. M., Levy, S. M., Marshall T. A., Cavanaugh, J. E., Curtis, A. M., Kolker, J. L. and Weber–Gasparoni, K. (2017). Dental caries clusters among adolescents. *Community Dentistry and Oral Epidemiology*, **45**, 538–544. (doi:10.1111/cdoe.12317)
- Peek–Asa, C., Butcher, B. and Cavanaugh, J. E. (2017). Cost of hospitalization for firearm injuries by firearm type, intent, and payer in the United States. *Injury Epidemiology*, **4**:20, doi:10.1186/s40621-017-0120-0.
- Hatzenbuehler, M. L., Flores, J. E., Cavanaugh, J. E., Onwuachi-Willig, A. and Ramirez, M. R. (2017). Anti-bullying policies and disparities in bullying: A state-level analysis. *American Journal of Preventive Medicine*, **53**, 184–191. (doi:10.1016/j.amepre.2017.02.004)
- Peterson, A. R., Kruse, A. J., Meester, S. M., Olson, T. S., Riedle, B. N., Slayman, T. G., Domeyer, T. J., Cavanaugh, J. E. and Smoot M. K. (2017). Youth football injuries: A Prospective Cohort. *The Orthopaedic Journal of Sports Medicine*, **5**(2), 2325967116686784, doi:10.1177/2325967116686784.
- Riedle, B. N., Polgreen, L. A., Cavanaugh, J. E., Schroeder, M. C. and Polgreen P. M. (2017). Phantom prescribing: Examining the frequency of antimicrobial prescriptions without a patient visit. *Infection Control & Hospital Epidemiology*, **38**, 273–280. (doi:10.1017/ice.2015.340)
- Peterson, R. A., Polgreen, L. A., Cavanaugh, J. E. and Polgreen P. M. (2017). Increasing incidence, cost, and seasonality in patients hospitalized for cellulitis. *Open Forum Infectious Diseases*, **4**(1):ofx008, doi:10.1093/ofid/ofx008.
- Simmering, J. E., Tang, F., Cavanaugh, J. E., Polgreen, L. A. and Polgreen P. M. (2017). The increase in hospitalizations for urinary tract infections and the associated costs in the United States, 1998–2011. *Open Forum Infectious Diseases*, **4**(1):ofw281, doi:10.1093/ofid/ofw281.
- Oleson, J. J., Cavanaugh J. E., Tomblin, J. B., Walker, E. and Dunn, C. (2016). Combining growth curves when a longitudinal study switches measurement tools. *Statistical Methods in Medical Research*, **25**, 2925–2938. (doi:10.1177/0962280214534588)
- Zhang, T. and Cavanaugh, J. E. (2016). A multistage algorithm for best-subset model selection based on the Kullback–Leibler discrepancy. *Computational Statistics*, **31**, 643–669. (doi:10.1007/s00180-015-0584-8)
- Ten Eyck, P. and Cavanaugh, J. E. (2016). The adjusted concordance statistic. In *Statistical, Stochastic and Data Analysis Methods and Applications*, edited by A. Karagrigoriou, T. Oliveira and C. H. Skiadas, 143–156. International Society for the Advancement of Science and Technology, Athens, Greece.



- Simmering, J. E., Polgreen, L. A., Comellas, A. P., Cavanaugh, J. E. and Polgreen, P. M. (2016). Identifying patients with COPD at high risk of readmission. *Chronic Obstructive Pulmonary Diseases: Journal of the COPD Foundation*, **3**, 729–738. (doi:10.15326/jcopdf.3.4.2016.0136)
- Miller, A. C., Polgreen, L. A., Cavanaugh, J. E. and Polgreen, P. M. (2016). Hospital *Clostridium difficile* infection rates and prediction of length of stay in patients without *C. difficile* infection. *Infection Control & Hospital Epidemiology*, **37**, 404–410. (doi:10.1017/ice.2015.340)
- Miller, A. C., Polgreen, L. A., Cavanaugh, J. E. and Polgreen, P. M. (2016). Hospital *Clostridium difficile* infection (CDI) incidence as a risk factor for hospital-associated CDI. *American Journal of Infection Control*, **44**, 825–829. (doi:10.1016/j.ajic.2016.01.006)
- Zahr, R. S., Peterson, R. A., Polgreen, L. A., Cavanaugh, J. E., Hornick, D. B., Winthrop, K. L. and Polgreen, P. M. (2016). Diabetes as an increasingly common comorbidity among patient hospitalizations for tuberculosis in the USA. *BMJ Open Diabetes Research and Care*, **4**:e000268, doi:10.1136/bmjdr-2016-000268.
- Suneja, M., Tang, F., Cavanaugh, J. E., Polgreen, L. A. and Polgreen P. M. (2016). Population based trends in the incidence of hospital admission for the diagnosis of hepatorenal syndrome: 1998–2011. *International Journal of Nephrology*, 8419719, doi:10.1155/2016/8419719.
- Ramirez, M., Bedford, R., Wu, H., Harland, K., Cavanaugh J. E. and Peek–Asa C. (2016). Lighting and marking policies are associated with reduced farm equipment-related crash rates: A policy analysis of nine Midwestern US states. *Occupational & Environmental Medicine*, **73**, 621–626. (doi:10.1136/oemed-2016-103672)
- Ramirez, M., Ten Eyck, P., Peek–Asa, C., Onwuachi–Willig, A. and Cavanaugh J. E. (2016). Evaluation of Iowa’s anti-bullying law. *Injury Epidemiology*, **3**:15, doi:10.1186/s40621-016-0080-9.
- Alshawabkeh, L. I., Hu, N., Carter, K. D., Opotowsky, A. R., Light–McGroary, K., Cavanaugh, J. E. and Bartlett, H. L. (2016). Wait-list outcomes for adults with congenital heart disease listed for heart transplantation in the U.S. (with editorial commentary). *Journal of the American College of Cardiology*, **68**, 908–917. (doi:10.1016/j.jacc.2016.05.082)
- Adam, R. J., Hisert, K. B., Dodd, J. D., Grogan, B., Launspach, J. L., Barnes, J. K., Gallagher, C. G., Sieren, J. P., Gross, T. J., Fischer, A. J., Cavanaugh, J. E., Hoffman, E. A., Singh, P. K., Welsh, M. J., McKone, E. F. and Stoltz D. A. (2016). Acute administration of ivacaftor to people with cystic fibrosis and a G551D–CFTR mutation reveals smooth muscle abnormalities. *JCI Insight*, **1**:e86183, doi:10.1172/jci.insight.86183.
- Ghazal, T., Levy, S. M., Childers, N. K., Broffitt, B. A., Caplan, D. J., Warren, J., Cavanaugh, J. E. and Kolker J. (2016). Dental caries in high-risk, school-age African American children in Alabama: A six-year prospective. *Pediatric Dentistry*, **38**, 224–230.
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- Huang, Y., Palaniappan, K., Zhuang, X. and Cavanaugh, J. E. (1995). Optic flow field segmentation and motion estimation using a robust genetic partitioning algorithm. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, **17**, 1177–1190.

## INVITED DISCUSSIONS

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- Peterson, R. A. and Cavanaugh, J. E. (2019). Discussion of “Prior–based Bayesian information criterion (PBIC),” by M. J. Bayarria, J. O. Berger, W. Jang, S. Ray, L. R. Pericchi and I. Visser. *Statistical Theory and Related Fields*, **3**, 32–34. (doi:10.1080/24754269.2019.1611145)
- Cavanaugh, J. E. (2012). Discussion of “Catching up faster by switching sooner: a predictive approach to adaptive estimation with an application to the AIC–BIC dilemma,” by T. van Erven, P. Grünwald and S. de Rooij. *Journal of the Royal Statistical Society, Series B*, **74**, 402–403.

## ENCYCLOPEDIA ENTRIES AND REFERENCE ARTICLES

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- Flores, J. E. and Cavanaugh, J. E. (2022). Akaike Information Criterion. In *Encyclopedia of Research Design (Second Edition)*, edited by B. Frey. Sage Publications, Thousand Oaks, California.
- Cavanaugh, J. E. (2020). Chaloner, Kathryn M. *Wiley StatsRef: Statistics Reference Online*, 1–4. Wiley, Hoboken, New Jersey. (doi:10.1002/9781118445112.stat08252)

- Flores, J. E. and Cavanaugh, J. E. (2018). Partial Likelihood. (Updated from an original article by D. Harrington.) *Wiley StatsRef: Statistics Reference Online*, 1–3. Wiley, Hoboken, New Jersey. (doi:10.1002/9781118445112.stat05932.pub2)
- Barr, J. R. and Cavanaugh, J. E. (2018) Forensics: Assessing model goodness – A machine learning view. In *Encyclopedia with Semantic Computing and Robotic Intelligence*, **2**, 1850015, 1–7. World Scientific, Singapore. (doi:10.1142/S2529737618500156)
- Cavanaugh, J. E. (2016). Model Selection: Bayesian Information Criterion. (Updated from an original article by A. F. M. Smith.) *Wiley StatsRef: Statistics Reference Online*, 1–3. Wiley, Hoboken, New Jersey. (doi:10.1002/9781118445112.stat00247.pub2)
- Cavanaugh, J. E. and Neath A. A. (2010). Akaike Information Criterion. In *International Encyclopedia of Statistical Sciences*, edited by M. Lovric. Springer, New York.
- Neath A. A. and Cavanaugh, J. E. and (2010). Multiple Comparisons Testing from a Bayesian Perspective. In *International Encyclopedia of Statistical Sciences*, edited by M. Lovric. Springer, New York.
- Cavanaugh, J. E. and Foster, E. D. (2010). Likelihood Ratio Statistic. In *Encyclopedia of Research Design*, edited by N. Salkind. Sage Publications, Thousand Oaks, California.
- Cavanaugh, J. E. and Foster, E. D. (2010). Margin of Error. In *Encyclopedia of Research Design*, edited by N. Salkind. Sage Publications, Thousand Oaks, California.
- Cavanaugh, J. E. and Foster, E. D. (2010). Odds. In *Encyclopedia of Research Design*, edited by N. Salkind. Sage Publications, Thousand Oaks, California.
- Cavanaugh, J. E. (2006). Akaike Information Criterion. In *Encyclopedia of Measurement and Statistics*, edited by N. Salkind. Sage Publications, Thousand Oaks, California.

## BOOK REVIEWS

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- Cavanaugh, J. (2011). Review of *Elementary Statistics Using Excel (Fourth Edition)*, by M. F. Triola. *The American Statistician*, **65**, 67.
- Cavanaugh, J. (2010). Review of *Probability and Statistical Inference (Second Edition)*, by R. V. Hogg and E. A. Tanis. *The American Statistician*, **64**, 275.
- Cavanaugh, J. (2010). Review of *Statistical Methods for Categorical Data Analysis (Second Edition)*, by D. A. Powers and Y. Xie. *Journal of the American Statistical Association*, **105**, 879.
- Cavanaugh, J. (2010). Review of *An Introduction to Generalized Linear Models (Third Edition)*, by A. J. Dobson and A. G. Barnett. *The American Statistician*, **64**, 95.
- Cavanaugh, J. (2010). Review of *Learning to Live with Statistics: From Concept to Practice*, by D. Asquith. *The American Statistician*, **64**, 89–90.
- Cavanaugh, J. (2009). Review of *Applied Regression Analysis and Generalized Linear Models (Second Edition)*, by J. Fox. *Journal of the American Statistical Association*, **104**, 1725–1726.
- Cavanaugh, J. (2009). Review of *Statistical Issues in Drug Development (Second Edition)*, by S. Senn. *Journal of the American Statistical Association*, **104**, 1291.

- Cavanaugh, J. (2009). Review of *Information Criteria and Statistical Modeling*, by S. Konishi and G. Kitagawa. *Journal of the American Statistical Association*, **104**, 1284–1285.
- Cavanaugh, J. (2009). Review of *Linear Models and Generalizations: Least Squares and Alternatives (Third Edition)*, by C. R. Rao, H. Toutenburg, Shalabh and C. Heumann. *Journal of the American Statistical Association*, **104**, 870.
- Cavanaugh, J. (2009). Review of *Sample Size Calculations in Clinical Research (Second Edition)*, by S.-C. Chow, J. Shao and H. Wang. *Journal of the American Statistical Association*, **104**, 425.
- Cavanaugh, J. (2009). Review of *Medical Biostatistics (Second Edition)*, by A. Indrayan. *The American Statistician*, **63**, 284–285.
- Cavanaugh, J. (2008). Review of *100 Statistical Tests (Third Edition)*, by G. K. Kanji. *Journal of the American Statistical Association*, **103**, 435.
- Cavanaugh, J. (2008). Review of *An Introduction to the Mathematics of Money*, by D. Lovelock, M. Mendel and A. L. Wright. *The American Statistician*, **62**, 185.
- Cavanaugh, J. (2007). Review of *Series Approximation Methods in Statistics (Third Edition)*, by J. E. Kolassa. *Journal of the American Statistical Association*, **102**, 1481.
- Cavanaugh, J. (2007). Review of *Encyclopedia of Statistical Sciences (Second Edition)*, edited by S. Kotz, C. B. Read, N. Balakrishnan and B. Vidakovic. *Journal of the American Statistical Association*, **102**, 1074.
- Cavanaugh, J. (2007). Review of *Statistics: The Exploration and Analysis of Data (Fifth Edition)*, by J. L. Devore and R. Peck. *The American Statistician*, **61**, 97–98.
- Cavanaugh, J. (2007). Review of *Seeing Through Statistics (Third Edition)*, by J. M. Utts; and *Mind on Statistics (Third Edition)*, by J. M. Utts and R. F. Heckard. *The American Statistician*, **61**, 95.
- Cavanaugh, J. (2006). Review of *Survival Analysis: A Self-Learning Text (Second Edition)*, by D. Kleinbaum and M. Klein. *Journal of the American Statistical Association*, **101**, 1318–1319.
- Cavanaugh, J. (2006). Review of *Advances in Minimum Description Length: Theory and Application*, edited by P. D. Grünwald, I. J. Myung and M. A. Pitt. *Journal of the American Statistical Association*, **101**, 859.
- Cavanaugh, J. (2006). Review of *Encyclopedia of Biostatistics (Second Edition)*, edited by P. Armitage and T. Colton. *Journal of the American Statistical Association*, **101**, 844.
- Cavanaugh, J. (2006). Review of *Handbook of Epidemiology*, edited by W. Ahrens and I. Pigeot. *Journal of the American Statistical Association*, **101**, 402–403.
- Cavanaugh, J. (2004). Review of *Regression Models for Time Series Analysis*, by B. Kedem and K. Fokianos. *Journal of the American Statistical Association*, **99**, 299.

## PROCEEDINGS PUBLICATIONS

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- Neath, A. A., Cavanaugh, J. and B. Riedle (2015). A connection between discrepancy function estimation and the p-value. In *2016 Proceedings of the American Statistical Association* (online). Alexandria, Virginia.

- Cavanaugh, J. E. and Neath, A. A. (2013). Model selection criteria based on computationally intensive estimators of the expected optimism. In *Proceedings of the 59th ISI World Statistics Congress* (Session IPS012), 127–132; <http://2013.isiproceedings.org/Files/IPS012-P4-S.pdf>.
- Neath, A. A., Cavanaugh, J. E. and Weyhaupt, A. G. (2012). Decision analysis and social choice theory. In *2012 Proceedings of the American Statistical Association* (CD-ROM; online). Alexandria, Virginia.
- Neath, A. A., Zhang Z. and Cavanaugh, J. E. (2009). Linear model selection for replicated data and nearly replicated data. In *2009 Proceedings of the American Statistical Association* (CD-ROM; online). Alexandria, Virginia.
- Neath, A. A. and Cavanaugh, J. E. (2008). A Bayesian conceptual predictive statistic. In *2008 Proceedings of the American Statistical Association* (CD-ROM; online). Alexandria, Virginia.
- Shang, J., Cavanaugh, J. E. and Wright F. T. (2007). A Bayesian multiple comparison procedure for order restricted unbalanced mixed models. In *2007 Proceedings of the American Statistical Association* (CD-ROM). Alexandria, Virginia.
- Neath, A. A., Downen, L. and Cavanaugh, J. E. (2007). Linear regression variable selection based on estimation of model bias. In *2007 Proceedings of the American Statistical Association* (CD-ROM). Alexandria, Virginia.
- Davis, J. W. and Cavanaugh, J. E. (2003). Time–frequency discrimination of nonstationary processes based on wavelets. In *2003 Proceedings of the American Statistical Association, Section on Physical and Engineering Sciences* (CD-ROM). Alexandria, Virginia.
- Davis, J. W. and Cavanaugh, J. E. (2001). A wavelet–based discriminant procedure for signal–plus–noise processes. In *2001 Proceedings of the American Statistical Association, Section on Physical and Engineering Sciences* (CD-ROM). Alexandria, Virginia.
- Hedberg, K. and Cavanaugh, J. E. (1999). Time series spectral discriminants based on Kullback information measures (with an application to seismology). In *1999 Proceedings of the American Statistical Association, Section on Statistics and the Environment*, 64–69. Alexandria, Virginia.

## SCIENTIFIC / POLICY REPORTS

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- Roberts, M. S., Cavanaugh, J. E., Danovitch, G., Gantz, D., Landsittel, D., Losina, E., Rhode, C., Schmeiser, B. and Burdick, J. (2004). Report of the independent expert panel on statistical methods for the analysis of organ transplantation data: simulation modeling. U.S. Department of Health and Human Services, Rockville, Maryland.
- Cavanaugh, J. E., McQuarrie, A. D. R. and Shumway, R. H. (1993). Parametric and nonparametric discriminants for regional earthquakes and explosions. Published and distributed by Phillips Laboratory, Hanscom Air Force Base, Massachusetts. (PL–TR–93–2164)

## R PACKAGES

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- Seedorff M. S., Oleson J. J., Brown G., Cavanaugh J. E. and McMurray B. (2017). Bootstrapped Differences of Time Series (bdots). Available on the Comprehensive R Archive Network (CRAN). (<https://cran.r-project.org/web/packages/bdots/index.html>)

- Yang, M., Zamba, G. D. K. and Cavanaugh, J. E. (2013). Statistical Model for Count Time Series with Excess Zeros (zim). Available on the Comprehensive R Archive Network (CRAN). (<https://cran.r-project.org/web/packages/ZIM/index.html>)

## PH.D. DISSERTATION

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- Cavanaugh, J. E. (1993). “Small-Sample Model Selection in the General State-Space Setting.” Dissertation advisor: Professor Robert H. Shumway.

## INVITED PRESENTATIONS: CONFERENCES AND MEETINGS

---

- Cavanaugh, J. E., Riedle, B. N. and Neath, A. N. (June, 2022). Probabilistic pairwise model comparisons based on discrepancy measures and a reconceptualization of the p-value. Plenary Address, 7<sup>th</sup> Stochastic Modeling Techniques and Data Analysis International Conference; Athens, Greece.
- Cavanaugh, J. E., Riedle, B. N. and Neath, A. N. (April, 2019). Probabilistic pairwise model comparisons based on discrepancy measures and a reconceptualization of the p-value. Keynote Address, Annual Meeting of the Albuquerque Section of the American Statistical Association; Santa Fe, New Mexico.
- Cavanaugh, J. E. (August, 2018). Model selection criteria based on symmetrized variants of asymmetric divergence measures. Topic Contributed Presentation, 2018 Joint Statistical Meetings; Vancouver, Canada.
- Cavanaugh, J. E., Riedle, B. N. and Neath, A. N. (September, 2017). Probabilistic pairwise model comparisons based on discrepancy measures and a reconceptualization of the p-value. Invited Presentation, Biostatistics in the Modern Computing Era; Medical College of Wisconsin, Milwaukee, Wisconsin.
- Cavanaugh, J. E., Yang, M. and Zamba, G. K. D. (July, 2015). State-space models for count time series with excess zeros. Invited Presentation, Applied Stochastic Models and Data Analysis International Conference; Piraeus, Greece.
- Cavanaugh, J. E., Yang, M. and Zamba, G. K. D. (May, 2015). State-space models for count time series with excess zeros. Invited Presentation, International Conference On Differential Equations and Dynamical Systems; Dallas, Texas.
- Cavanaugh, J. E., Yang, M. and Zamba, G. K. D. (September, 2013). State-space models for count time series with excess zeros. Invited Presentation, Frontiers in Methodological and Applied Statistics: A Celebration of 50 Years of MU’s Department of Statistics, University of Missouri; Columbia, Missouri.
- Cavanaugh, J. E. and Neath, A. A. (August, 2013). Model selection criteria based on computationally intensive estimators of the expected optimism (with an application to the use of biomarkers for treatment evaluation). Invited Presentation, 59th ISI World Statistics Congress; Hong Kong, China.
- Cavanaugh, J. E. (August, 2013). Model selection criteria based on computationally intensive estimators of the expected optimism (with an application to the use of biomarkers for treatment evaluation). Topic Contributed Presentation, 2013 Joint Statistical Meetings; Montreal, Canada.

- Cavanaugh, J. E. (July, 2012). Model selection criteria based on computationally intensive estimators of the expected optimism. Invited Presentation, ICNPAA Congress: Mathematical Problems in Engineering, Aerospace and Sciences; Vienna, Austria.
- Cavanaugh, J. E., Foster, E. D., Yang, M. and Polgreen, P. M. (May, 2011). A time series analysis to investigate the relationship between acute myocardial infarction incidence and influenza activity. Invited Presentation, International Conference on Risk Analysis; Limassol, Cyprus.
- Cavanaugh, J. E. and Bengtsson, T. (August, 2008). State–space discrimination and clustering of atmospheric time series data based on Kullback information measures. Topic Contributed Presentation (Session: Time Series, State Space Models and Other Reflections on the Work of Bob Shumway), 2008 Joint Statistical Meetings; Denver, Colorado.
- Cavanaugh, J. E. (June, 2008). Model selection criteria based on computationally intensive estimators of the expected optimism. Invited Presentation, 2008 Statistical Conference in Honor of Bob Shumway, University of California; Davis, California.
- Cavanaugh, J. E. (September, 2007). Occam’s razor and statistical model selection. Keynote Address, Annual Meeting of the Montana Section of the American Statistical Association; Butte, Montana.
- Cavanaugh, J. E. and Bengtsson, T. (July, 2007). State–space discrimination and clustering of atmospheric time series data based on Kullback information measures. Topic Contributed Presentation, 2007 Joint Statistical Meetings; Salt Lake City, Utah.
- Cavanaugh, J. E., Davies, S. L. and Neath, A. A. (May, 2006). Discrepancy–based model selection criteria using cross–validation. Invited Presentation, International Conference on Statistical Models for Biomedical and Technical Systems; Limassol, Cyprus.
- Cavanaugh, J. E. and Davis, J. W. (August, 2003). Time–frequency discrimination of nonstationary processes based on wavelets. Invited Technical Exhibit, 2003 Joint Statistical Meetings; San Francisco, California.
- Cavanaugh, J. E. (August, 2003). Criteria for linear model selection based on Kullback’s symmetric divergence. Invited Presentation, Justus F. Seely Memorial Conference on Linear Models, Oregon State University; Corvallis, Oregon.
- Cavanaugh, J. E., Wang, Y. and Song, C. (June, 2000). Self–similarity index estimation via wavelets for locally self–similar processes. Special Invited Presentation, International Conference on Statistics in the 21<sup>st</sup> Century, University of Maine; Orono, Maine.
- Cavanaugh, J. E. and Johnson, W. O. (August, 1996). Assessing the predictive influence of cases in a state–space process. Topic Contributed Presentation, 1996 Joint Statistical Meetings; Chicago, Illinois.

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#### INVITED PRESENTATIONS: DEPARTMENTAL SEMINARS AND COLLOQUIA

- Cavanaugh, J. E., Zamba, G. K. D., Yang, M. and Tang, F. (October, 2019). Models for overdispersed count time series with excess zeros. Departmental Colloquium, Department of Mathematics and Statistics, University of New Mexico; Albuquerque, New Mexico.
- Cavanaugh, J. E., Zamba, G. K. D., Yang, M. and Tang, F. (March, 2019). Models for overdispersed count time series with excess zeros. Departmental Seminar, Department of Biostatistics, Indiana University; Indianapolis, Indiana.

- Cavanaugh, J. E. (April, 2015). Model selection criteria based on computationally intensive estimators of the expected optimism. Departmental Seminar, Department of Biostatistics, Penn State University; Hershey, Pennsylvania.
- Cavanaugh, J. E. (March, 2012). Occam's razor and statistical model selection. Seminar, Institute for Quantitative Biology, East Tennessee State University; Johnson City, Tennessee.
- Cavanaugh, J. E. (November, 2011). Model selection criteria based on computationally intensive estimators of the expected optimism. Departmental Colloquium, Department of Statistics, University of Missouri; Columbia, Missouri.
- Cavanaugh, J. E. and Bengtsson, T. (April, 2009). State-space discrimination and clustering of atmospheric time series data based on Kullback information measures. Departmental Colloquium, Department of Statistics, University of California; Irvine, California.
- Cavanaugh, J. E. (February, 2009). An analysis of the Iowa child passenger safety survey based on generalized linear mixed models. Biostatistics Seminar, New York State Psychiatric Institute, Columbia University; New York, New York.
- Cavanaugh, J. E. (February, 2009). Model selection criteria based on computationally intensive estimators of the expected optimism. Departmental Seminar, Department of Biostatistics, Columbia University; New York, New York.
- Cavanaugh, J. E. (March, 2008). Occam's razor and statistical model selection. Lukacs Visiting Professor Departmental Colloquium, Department of Mathematics and Statistics, Bowling Green State University; Bowling Green, Ohio.
- Cavanaugh, J. E., Davies, S. L. and Neath, A. A. (March, 2008). Discrepancy-based model selection criteria using cross validation. Lukacs Visiting Professor Statistics Seminar, Department of Mathematics and Statistics, Bowling Green State University; Bowling Green, Ohio.
- Cavanaugh, J. E., Davies, S. L. and Neath, A. A. (October, 2007). Discrepancy-based model selection criteria using cross validation. Departmental Seminar, Department of Biostatistics and Epidemiology, University of Pennsylvania; Philadelphia, Pennsylvania.
- Cavanaugh, J. E. (December, 2006). Occam's razor and statistical model selection. Special Biostatistics Seminar, New York State Psychiatric Institute, Columbia University; New York, New York.
- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (October, 2006). An alternate version of the conceptual predictive statistic. Departmental Colloquium, Department of Mathematical Sciences, Montana State University; Bozeman, Montana.
- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (September, 2006). An alternate version of the conceptual predictive statistic. Departmental Colloquium, Department of Statistics, University of Minnesota; Minneapolis, Minnesota.
- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (February, 2006). An alternate version of the conceptual predictive statistic. Departmental Colloquium, Departments of Statistics and Biostatistics, University of Florida; Gainesville, Florida.
- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (October, 2005). An alternate version of the conceptual predictive statistic. Departmental Colloquium, Department of Statistics, Oklahoma State University; Stillwater, Oklahoma.

- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (September, 2005). An alternate version of the conceptual predictive statistic. Departmental Seminar, Department of Biostatistics, Columbia University; New York, New York.
- Cavanaugh, J. E. (November, 2004). Criteria for linear model selection based on Kullback's symmetric divergence. Departmental Colloquium, Department of Statistics, Iowa State University; Ames, Iowa.
- Cavanaugh, J. E. (March, 2004). Criteria for linear model selection based on Kullback's symmetric divergence. Departmental Colloquium, Department of Statistics, University of Illinois; Urbana-Champaign, Illinois.
- Cavanaugh, J. E., Wang, Y. and Davis, J. W. (April, 2003). Locally self-similar processes and their wavelet analyses. Departmental Colloquium, Department of Biostatistics, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E., Wang, Y. and Davis, J. W. (April, 2003). Locally self-similar processes and their wavelet analyses. Departmental Colloquium, Department of Mathematics and Statistics, Arizona State University; Tempe, Arizona.
- Cavanaugh, J. E., Wang, Y. and Davis, J. W. (May, 2002). Locally self-similar processes and their wavelet analyses. Departmental Colloquium, Department of Statistics, University of California; Davis, California.
- Cavanaugh, J. E. and Davies, S. L. (April, 2002). Discrepancy-based model selection criteria using cross-validation. Departmental Colloquium, Department of Mathematics and Statistics, University of New Mexico; Albuquerque, New Mexico.
- Cavanaugh, J. E. and Neath, A. A. (November, 2000). A regression model selection criterion based on bootstrap bumping for use with resistant fitting. Departmental Colloquium, Department of Statistics, University of Wyoming; Laramie, Wyoming.
- Cavanaugh, J. E. and Davies, S. L. (May, 2000). Discrepancy-based model selection criteria using cross-validation. Departmental Colloquium, Department of Statistics, Harvard University; Boston, Massachusetts.
- Cavanaugh, J. E. and Neath, A. A. (May, 2000). A regression model selection criterion based on bootstrap bumping for use with resistant fitting. Departmental Colloquium, Department of Mathematics and Statistics, Boston University; Boston, Massachusetts.
- Cavanaugh, J. E. and Shumway, R. H. (April, 1994). A bootstrap variant of AIC for state-space model selection. Departmental Colloquium, Department of Mathematics and Statistics, University of New Mexico; Albuquerque, New Mexico.
- Cavanaugh, J. E. and Shumway, R. H. (March, 1993). A bootstrap variant of AIC for state-space model selection. Departmental Colloquium, Department of Mathematics and Statistics, University of Nebraska; Lincoln, Nebraska.
- Cavanaugh, J. E. and Shumway, R. H. (March, 1993). A bootstrap variant of AIC for state-space model selection. Departmental Colloquium, Department of Mathematics, University of Kansas; Lawrence, Kansas.



- Cavanaugh, J. E. and Shumway, R. H. (March, 1993). A bootstrap variant of AIC for state–space model selection. Departmental Colloquium, Department of Mathematical Sciences, University of Arkansas; Fayetteville, Arkansas.
- Cavanaugh, J. E. and Shumway, R. H. (February, 1993). A bootstrap variant of AIC for state–space model selection. Colloquium, Pacific Northwest National Laboratory; Richland, Washington.
- Cavanaugh, J. E. and Shumway, R. H. (February, 1993). A bootstrap variant of AIC for state–space model selection. Departmental Colloquium, Department of Statistics, University of Missouri; Columbia, Missouri.
- Cavanaugh, J. E. and Shumway, R. H. (February, 1993). A bootstrap variant of AIC for state–space model selection. Colloquium, Los Alamos National Laboratory; Los Alamos, New Mexico.

#### INVITED PRESENTATIONS: HOME INSTITUTION

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- Cavanaugh, J. E. (November, 2022). Reassessing health sciences research: Moving beyond p–values and statistical significance. 2022 College of Public Health Distinguished Faculty Lecture, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (May, 2019). Biostatistics: An applied mathematical and computational science on the interface of biomedicine and public health. Seminar in Applied Mathematics and Computational Sciences, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E., Zamba, G. K. D., Yang, M. and Tang, F. (November, 2017). Models for overdispersed count time series with excess zeros. Departmental Colloquium, Department of Statistics and Actuarial Sciences, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (May, 2014). Occam’s razor and statistical model selection. Seminar in Applied Mathematics and Computational Sciences, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (March, 2014). Mixed effects and hierarchical modeling. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (December, 2013). Multivariable modeling. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (February, 2013). Biostatistics and public health. MPH Professional Development Seminar, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (February, 2013). Power and sample size assessments / Multiple inference procedures. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (October, 2012). Multivariable modeling. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (October, 2011). Multivariable modeling. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (April, 2010). Multiple comparisons. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.

- Cavanaugh, J. E. (March, 2010). Model selection criteria based on computationally intensive estimators of the expected optimism. Departmental Colloquium, Department of Statistics and Actuarial Sciences, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (December, 2009). Careers in Biostatistics. Explorations in Computing, Mathematics, and Science; University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (October, 2009). Multivariable modeling. Seminar in Clinical and Translational Research, Institute for Clinical and Translational Science, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (November, 2007). Power and sample size assessments. Seminar in Clinical and Translational Research, Iowa Scholars in Clinical Investigation, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. (February, 2007). Model selection. Seminar in Clinical Research, Iowa Scholars in Clinical Investigation, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E., Davies, S. L. and Neath, A. A. (November, 2006). Discrepancy-based model selection criteria using cross validation. Departmental Colloquium, Department of Statistics and Actuarial Sciences, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (October, 2005). An alternate version of the conceptual predictive statistic. Departmental Colloquium, Department of Biostatistics, University of Iowa; Iowa City, Iowa.
- Cavanaugh, J. E. and Neath, A. A. (October, 2000). A regression model selection criterion based on bootstrap bumping for use with resistant fitting. Departmental Colloquium, Department of Statistics, University of Missouri; Columbia, Missouri.
- Cavanaugh, J. E. and Johnson, W. O. (March, 1996). Assessing the predictive influence of cases in a state-space process. Departmental Colloquium, Department of Statistics, University of Missouri; Columbia, Missouri.
- Cavanaugh, J. E., McQuarrie, A. D. R. and Shumway, R. H. (October, 1994). Parametric and nonparametric discriminants for regional earthquakes and explosions. Departmental Colloquium, Department of Statistics, University of Missouri; Columbia, Missouri.

#### CONTRIBUTED PRESENTATIONS: CONFERENCES AND MEETINGS

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- Cavanaugh, J. E., Neath, A. A. and Davies, S. L. (August, 2005). An alternate version of the conceptual predictive statistic. Contributed Presentation, 2005 Joint Statistical Meetings; Minneapolis, Minnesota.
- Cavanaugh, J. E., Wang, Y. and Song, C. (August, 2001). Self-similarity index estimation via wavelets for locally self-similar processes. Contributed Presentation, 2001 Joint Statistical Meetings; Atlanta, Georgia.
- Cavanaugh, J. E. (August, 1999). Criteria for linear model selection based on Kullback's symmetric divergence. Contributed Presentation, 1999 Joint Statistical Meetings; Baltimore, Maryland.
- Cavanaugh, J. E. (July, 1997). A new class of model selection criteria based on Kullback's symmetric divergence. Contributed Presentation, 1997 IMS Meetings; Park City, Utah.

- Cavanaugh, J. E. (July, 1997). A new class of model selection criteria based on Kullback’s symmetric divergence. Contributed Presentation, 1997 IMS New Researchers’ Conference, University of Wyoming; Laramie, Wyoming.
- Cavanaugh, J. E. and Johnson, W. O. (May, 1996). Assessing the predictive influence of cases in a state–space process. Contributed Presentation, Kullback Memorial Research Conference; Washington, D.C.
- Cavanaugh, J. E. (April, 1996). Estimators of Kullback–Leibler information for time series model selection. Contributed Presentation, Mid–Missouri Conference on Longitudinal Data Analysis, University of Missouri; Columbia, Missouri.
- Cavanaugh, J. E. and Shumway, R. H. (August, 1995). On computing the expected Fisher information matrix for state–space model parameters. Contributed Presentation, 1995 Joint Statistical Meetings; Orlando, Florida.
- Cavanaugh, J. E. and Shumway, R. H. (August, 1994). A bootstrap variant of AIC for state–space model selection. Contributed Presentation, 1994 Joint Statistical Meetings; Toronto, Canada.

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#### EXTERNAL RESEARCH SUPPORT: SOLE INVESTIGATOR

- Recipient of a 3–year grant from the National Science Foundation, Division of Mathematical Sciences (DMS–9704436; PI). Title of proposal: “A New Class of Model Selection Criteria Based on Kullback’s Symmetric Divergence.” Total amount of award: \$70,120. Period of funding: July, 1997, to December, 2000.

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#### INTERNAL RESEARCH SUPPORT: SOLE INVESTIGATOR

- Awarded a 1996 Summer Research Fellowship in the amount of \$7,000 from the Research Council of the University of Missouri. Title of proposal: “The EM Algorithm in State–Space Modeling.”
- Awarded a 1994–1995 12–month grant in the amount of \$10,900 from the Research Board of the University of Missouri System. Title of proposal: “New Bootstrap Methodologies for State–Space Modeling.”
- Awarded a 1994 Summer Research Fellowship in the amount of \$4,000 from the Research Council of the University of Missouri. Title of proposal: “New Bootstrap Methodologies for State–Space Modeling.”

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#### EXTERNAL RESEARCH SUPPORT: COLLABORATIVE

- Currently funded as a co–investigator on a Centers for Disease Control R49 injury research grant (R49–CE002108). Title of proposal: “Iowa Injury Prevention Research Center.” PI: Carri Casteel. Amount of funding: 8%–10% of salary. Period of funding: August, 2019, to July, 2024.
- Currently funded as a co–investigator on a National Institutes of Health Clinical and Translational Research Award (UL1–TRR002537). Title of proposal: “UI Clinical and Translational Science Program.” PI: Patricia Winokur. Amount of funding: 7%–10% of salary. Period of funding: April, 2018, to February, 2023.

- Currently funded as a co-investigator on a National Institutes of Health R01 research project grant (R01-AI143671). Title of proposal: “Estimating the Risk for and Severity of Respiratory Infections Attributable to CFTR Heterozygosity.” PI: Philip Polgreen. Amount of funding: 8%–16% of salary. Period of funding: April, 2021, to March, 2026.
- Currently funded as a co-investigator on a National Institutes of Health R01 research project grant (R01-HS027375). Title of proposal: “An Expert-Guided Machine-Learning Approach to Estimate the Incidence, Risk and Harms Associated with Diagnostic Delays for Infectious Diseases.” PIs: Philip Polgreen and Aaron Miller. Amount of funding: 10%–16% of salary. Period of funding: September, 2019, to September, 2023.
- Currently funded as a co-investigator on a U54 specialized center grant from the U.S. Department of Health and Human Services and the Centers for Disease Control (U54-OH007548). Title of proposal: “Great Plains Center for Agricultural Health and Safety.” PI: Renee Anthony. Amount of funding: 1%–6% of salary. Period of funding: September, 2022, to September, 2027.
- Currently funded as a co-investigator on a National Institutes of Health R25 education grant (R25-HL161716). Title of proposal: “Iowa Summer Institute for Research Education in Biostatistics and Data Science.” PI: Gideon Zamba. Amount of funding: 6% of salary. Period of funding: August, 2022, to February, 2027.
- Currently funded as a co-investigator on a National Institutes of Health R25 education grant (R25-HL147231). Title of proposal: “Iowa Summer Institute for Research Education in Biostatistics.” PI: Gideon Zamba. Amount of funding: 4%–6% of salary. Period of funding: March, 2019, to February, 2023.
- Funded as a co-investigator on a U54 specialized center grant from the U.S. Department of Health and Human Services and the Centers for Disease Control (U54-OH007548). Title of proposal: “Great Plains Center for Agricultural Health and Safety.” PI: Renee Anthony. Amount of funding: 2%–11% of salary. Period of funding: October, 2019, to September, 2022.
- Funded as a co-investigator on a National Institutes of Health U01 research project grant (U01-CE002961). Title of proposal: “Implementation of a Medication Care Plan to Reduce Unintentional Injury among Rural Older Adults.” Subcontract PI: Carri Casteel. Amount of funding: 2% of salary. Period of funding: September, 2018, to September, 2022.
- Funded as principal investigator on a subcontract for a R01 research project grant from the Centers for Disease Control (R01-CE002913). Title of proposal: “Anti-Bullying Laws and Youth Violence in the United States: A Longitudinal Evaluation of Efficacy and Implementation.” Subcontract PI: Joseph E. Cavanaugh. Amount of funding: 5% of salary. Period of funding: September, 2017, to December, 2021.
- Funded as a co-investigator on a research project grant from the National Institute of Justice, Department of Justice (2016-CK-BX-0006). Title of proposal: “Link for Schools: A System to Prevent Violence and its Adverse Impacts.” PIs: Karen Heimer and Marizen Ramirez. Amount of funding: 1%–5% of salary. Period of funding: October, 2017, to June, 2018; July, 2019, to August, 2021.
- Funded as a co-investigator on a National Institutes of Health D43 international research training grant (D43-TW007261). Title of proposal: “iCREATE: Increasing Capacity in Research in Eastern Europe.” PI: Corinne Peek-Asa. Amount of funding: 1%–8% of salary. Period of funding: July, 2017, to August, 2021.

- Funded as a co-investigator on a subcontract for a R01 research project grant from the National Institute for Occupational Safety and Health (R01-OH010928). Title of proposal: “Understanding Workplace Violence among Young Workers in the U.S.” Subcontract PI: Carri Casteel. Amount of funding: 5% of salary. Period of funding: March, 2017, to September, 2019.
- Funded as a co-investigator on a Centers for Disease Control R49 injury research grant (R49-CE002108). Title of proposal: “Iowa Injury Prevention Research Center.” PI: Corinne Peek-Asa. Amount of funding: 10%–16% of salary. Period of funding: August, 2012, to July, 2019.
- Funded as a co-investigator on a National Institutes of Health R25 education grant (R25-HL131467). Title of proposal: “Iowa Summer Institute for Research Education in Biostatistics.” PI: Gideon Zamba. Amount of funding: 5% of salary. Period of funding: February, 2016, to January, 2019.
- Funded as a co-investigator on a CER comparative effectiveness research grant from the Patient-Centered Outcomes Research Institute (PCORI) (CER-1306-02918). Title of proposal: “Evaluation of Parent-Based Interventions to Support Children after Traumatic Injury.” PI: Marizen Ramirez. Amount of funding: 1%–5% of salary. Period of funding: February, 2014, to August, 2018.
- Funded as a co-investigator on a National Institutes of Health R56 research project grant (R56-DE012101). Title of proposal: “Fluoride, Dietary, and Other Factors Related to Young Adult Bone Measure and Dental Caries.” PI: Steven Levy. Amount of funding: 3%–10% of salary. Period of funding: September, 2015, to July, 2018.
- Funded as a co-investigator on a National Institutes of Health R21 exploratory / developmental research project grant (R21-DK108019). Title of proposal: “An mHealth Intervention to Increase Activity among Patients at Risk for Type 2 Diabetes.” PI: Phillip Polgreen. Amount of funding: 14% of salary. Period of funding: April, 2018, to July, 2018.
- Funded as a biostatistician by the Signal Center for Health Innovation, jointly sponsored by the University of Iowa, University of Iowa Health Care, University of Iowa Health Alliance, and University of Iowa Hospitals and Clinics Health Care Information Systems. PI: Patrick Brophy. Project Director: Philip Polgreen. Amount of funding: 10% of salary. Period of funding: January, 2016, to March, 2018.
- Funded as a co-investigator on a National Institutes of Health R03 research project grant (R03-DE023784). Title of proposal: “Secondary Analyses of Adolescent Caries, Including Fluoride, Diet and Other Factors.” PI: Steven Levy. Amount of funding: 10% of salary. Period of funding: August, 2014, to July, 2017.
- Funded as a co-investigator on a U54 specialized center grant from the U.S. Department of Health and Human Services and the Centers for Disease Control (U54-OH007548). Title of proposal: “Great Plains Center for Agricultural Health and Safety.” PI: Renee Anthony. Amount of funding: 2%–12% of salary. Period of funding: March, 2012, to March, 2017.
- Funded as a co-investigator on a R18 research project grant from the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality (R18-HS022467). Title of proposal: “Implementation and Effectiveness of a *S. aureus* Surgical Site Infection Prevention Bundle.” PI: Loreen Herwaldt. Amount of funding: 2.5%–5% of salary. Period of funding: April, 2014, to September, 2016.

- Funded as a co–investigator on a U19 multiple project grant from the U.S. Department of Health and Human Services (U19–OH008868). Title of proposal: “Healthier Workforce Center for Excellence.” PI: Diane Rohlman. Amount of funding: 2% of salary. Period of funding: October, 2011, to August, 2016.
- Funded as a co–investigator on a National Institutes of Health R01 research project grant (R01–HD065095). Title of proposal: “A Randomized Controlled Trial to Improve Teen Driving.” PI: Corinne Peek–Asa. Amount of funding: 1%–4% of salary. Period of funding: February, 2011, to July, 2016.
- Funded as a co–investigator on a National Institutes of Health R56 research project grant (R56–AG046539). Title of proposal: “Stress and Decision Making in Older Persons: Toward a Neurobehavioral Phenotype.” PI: Natalie Denburg. Amount of funding: 3.5% of salary. Period of funding: July, 2015, to May, 2016.
- Funded as a co–investigator on a National Institutes of Health T15 training and career development grant (T15–HL097622). Title of proposal: “Iowa Summer Institute in Biostatistics.” PI: Gideon Zamba. Amount of funding: 4%–8% of salary. Period of funding: March, 2013, to February, 2016.
- Funded as a co–investigator on a National Institutes of Health U01 research project grant (U01–HL102288). Title of proposal: “Iowa Phase II Clinical Trials of Novel Therapies in Lung Disease.” PI: Lakshmi Durairaj. Amount of funding: 15%–25% of salary. Period of funding: July, 2010, to July, 2015.
- Funded as a co–investigator on a National Institutes of Health Clinical and Translational Research Award (UL1–RR024979). Title of proposal: “UI Clinical and Translational Science Program.” PI: Gary Rosenthal. Amount of funding: 8%–10% of salary. Period of funding: July, 2009, to May, 2014.
- Funded as a co–investigator on a grant from the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality (HHSA–29020006100021). Title of proposal: “Optimizing Pre–Operative Antibiotic Prophylaxis for Cardiac and Orthopedic Procedures.” PI: Loreen Herwaldt. Amount of funding: 5% of salary. Period of funding: December, 2010, to August, 2013.
- Funded as a biostatistician on a grant from Delta Dental of Iowa. Title of proposal: “Iowa Fluoride Study Age 17 Data Collection.” PI: Steven Levy. Amount of funding: 10% of salary. Period of funding: January, 2011, to December, 2012.
- Funded as a co–investigator on a Centers for Disease Control R49 injury research grant (R49–CD001167). Title of proposal: “Iowa Injury Prevention Research Center.” PI: Corinne Peek–Asa. Amount of funding: 10%–20% of salary. Period of funding: September, 2007, to July, 2012.
- Funded as a co–investigator on a R18 research project grant from the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality (R18–HS018447). Title of proposal: “A Collaborative Model of Mental Health Care for Older Iowans.” PI: Brian Kaskie. Amount of funding: 10% of salary. Period of funding: September, 2009, to July, 2012.
- Funded as a co–investigator on a National Institutes of Health R01 research project grant (R01–CA122934). Title of proposal: “Elderly Cancer Survivors: Cognitive Outcomes and Markers of Neurodegeneration.” PI: Susan Schultz. Amount of funding: 5% of salary. Period of funding: June, 2007, to April, 2012.

- Funded as a biostatistician on a grant from Pfizer, Inc. Title of proposal: “Optimizing Influenza Surveillance in a Rural State.” PI: Philip Polgreen. Amount of funding: 10% of salary. Period of funding: September, 2008, to June, 2010.
- Funded as a co-investigator on a Centers for Disease Control R49 injury research grant (R49–CE000947). Title of proposal: “Parent–Based Intervention to Increase Safe Teen Driving.” PI: Corinne Peek–Asa. Amount of funding: 5% of salary. Period of funding: September, 2007, to September, 2009.
- Funded as a co-investigator on a National Institutes of Health R01 research project grant (R01–DE009551). Title of proposal: “Longitudinal Study of Fluoride, Diet, Caries and Fluorosis.” PI: Steven Levy. Amount of funding: 10% of salary. Period of funding: July, 2007, to June, 2009.
- Funded as a co-investigator on a Centers for Disease Control R49 injury research grant (R49–CCR721682). Title of proposal: “Iowa Injury Prevention Research Center.” PI: Corinne Peek–Asa. Amount of funding: 20% of salary. Period of funding: January, 2006, to September, 2007.
- Funded as a co-investigator on a National Institutes of Health K30 clinical research curriculum grant (K30–HL04117). Title of proposal: “Graduate Training Program in Clinical Research.” PI: Gary Rosenthal. Amount of funding: 15% of salary. Period of funding: October, 2004, to September, 2007.
- Funded as a co-investigator on a corporate health program contract with United Services Automobile Association. PI: Neal Kohatsu. Amount of funding: 5% of salary. Period of funding: August, 2004, to August, 2007.
- Funded as a biostatistician on a subcontract for a grant from the Centers for Disease Control and the Infectious Disease Society of America. Title of proposal: “The Emerging Infections Network.” Subcontract PI: Philip Polgreen. Total amount of funding: \$16,000. Funding distributions: June, 2006, and April, 2007.
- Contributed one of five project descriptions to a computing equipment grant proposal submitted to the National Science Foundation by the Department of Statistics, University of Missouri (DMS–9508296; Co–PI). Title of proposal: “Statistics Research Computing Equipment.” Total amount of award: \$60,912. Period of funding: August, 1995, to July, 1997.

#### INTERNAL RESEARCH SUPPORT: COLLABORATIVE

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- With F. T. Wright (PI), awarded a 2004–2005 12–month grant in the amount of \$15,000 from the Research Board of the University of Missouri System. Title of proposal: “Unified Bayesian Order–Restricted Inferences.”

#### GRADUATE ADVISING

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- Have supervised 19 doctoral dissertations: 13 in Biostatistics, 5 in Statistics, and 1 in Applied Mathematical and Computational Sciences.
- Presently serving as doctoral dissertation advisor for 3 students, Andres Dajles, Scott Koeneman, and Erik Boonstra.
- Have supervised 26 master’s preceptorships in Biostatistics and 13 master’s projects in Statistics.

- Have served on 97 doctoral committees and 35 master’s committees, for graduates in Biostatistics, Statistics, Animal Science, Biomedical Engineering, Dentistry, Economics, Educational Measurement and Statistics, Electrical Engineering, Epidemiology, Finance, Fisheries and Wildlife, Mathematics, Occupational and Environmental Health, Pharmacy, Political Science, Psychiatry, and Translational Biomedicine.
- Presently serving on 2 doctoral dissertation committees and 1 doctoral examination committee.

## DOCTORAL ADVISEES

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- Elliot Burghardt, Department of Biostatistics, University of Iowa. Defended November, 2021. Supervised with Daniel Sewell. Dissertation: “Agglomerative and Divisive Hierarchical Bayesian Clustering with Methods for Longitudinal and Time-to-Event Data”
- Javier E. Flores, Department of Biostatistics, University of Iowa. Defended April, 2021. Dissertation: “A New Class of Information Criteria for Improved Prediction in the Presence of Training/Validation Data Heterogeneity.”
- Ryan A. Peterson, Department of Biostatistics, University of Iowa. Defended April, 2019. Dissertation: “Ranked Sparsity: A Regularization Framework for Selecting Features in the Presence of Prior Informational Asymmetry.”
- Benjamin N. Riedle, Department of Biostatistics, University of Iowa. Defended April, 2018. Dissertation: “Probabilistic Pairwise Model Comparisons Based on Discrepancy Measures and a Reconceptualization of the p-Value.”
- Nan Hu, Department of Mathematics, Applied Mathematical and Computational Sciences, University of Iowa. Defended July, 2016. Dissertation: “A Unified Discrepancy-Based Approach for Balancing Efficiency and Robustness in State-Space Modeling Estimation, Selection, and Diagnosis.”
- Fan Tang, Department of Biostatistics, University of Iowa. Defended November, 2015. Dissertation: “Structural Time Series Clustering, Modeling, and Forecasting in the State-Space Framework.”
- Patrick Ten Eyck, Department of Biostatistics, University of Iowa. Defended July, 2015. Dissertation: “Problems in Generalized Linear Model Selection and Predictive Evaluation for Binary Outcomes.”
- Knute Carter, Department of Biostatistics, University of Iowa. Defended December, 2013. Dissertation: “Best-Subset Model Selection Based on Multitudinal Assessments of Likelihood Improvements.”
- Tao Zhang, Department of Biostatistics, University of Iowa. Defended April, 2013. Dissertation: “Discrepancy-Based Algorithms for Best-Subset Model Selection.”
- Eric D. Foster, Department of Biostatistics, University of Iowa. Defended July, 2012. Dissertation: “State Space Time Series Clustering Using Discrepancies Based on the Kullback-Leibler Information and the Mahalanobis Distance.”
- Ming Yang, Department of Biostatistics, University of Iowa. Defended April, 2012. Supervised with Gideon K. D. Zamba. Dissertation: “Statistical Models for Count Time Series with Excess Zeros.”
- C. Laura Acion, Department of Biostatistics, University of Iowa. Defended August, 2011. Dissertation: “Criteria for Generalized Linear Model Selection Based on Kullback’s Symmetric Divergence.”



- JonDavid Sparks, Department of Biostatistics, University of Iowa. Defended October, 2009. Dissertation: “Model Selection Criteria in the Presence of Missing Data Based on the Kullback–Leibler Discrepancy.”
- Zugui Zhang, Department of Biostatistics, University of Iowa. Defended June, 2007. Dissertation: “Linear Model Selection for Exactly and Nearly Replicated Data Based on Conceptual Predictive Statistics.”
- Junfeng Shang, Department of Statistics, University of Missouri. Defended July, 2005. Supervised with F. T. Wright. Dissertation: “Assessing Predictive Influence, Model Selection, and Bayesian Multiple Comparisons Under Order Restrictions.”
- J. Wade Davis, Department of Statistics, University of Missouri. Defended July, 2003. Dissertation: “Wavelet–Based Methods for Estimation and Discrimination.”
- Simon L. Davies, Department of Statistics, University of Missouri. Defended July, 2002. Dissertation: “Discrepancy–Based Model Selection Criteria Using Cross–Validation.”
- Hyun–Joo Kim, Department of Statistics, University of Missouri. Defended July, 2000. Dissertation: “Model Selection Criteria Based on Kullback Information Measures for Weibull, Logistic, and Nonlinear Regression Frameworks.”
- Thomas Bengtsson, Department of Statistics, University of Missouri. Defended April, 2000. Dissertation: “Time Series Discrimination, Signal Comparison Testing, and Model Selection in the State–Space Framework.”

#### MASTER’S PRECEPTORSHIPS DIRECTED

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- “Evaluating Risk Factors for SARS–CoV–2 Seropositivity in UIHC and CCOM Healthcare Personnel,” Allison Schuette, Department of Biostatistics, University of Iowa. Completed Spring, 2022.
- “Big Data and Multiple Imputation: Modeling COVID Mortality Based on CDC Data,” Jacob Seedorff, Department of Biostatistics, University of Iowa. Completed Spring, 2022.
- “An Investigation of AIC Variants for Variable Selection in the Presence of Multiple Imputation,” Nathan Cunicelli, Department of Biostatistics, University of Iowa. Completed Spring, 2021.
- “Exploring Change–Point Diagnostics for Discrete–Time Models,” Scott H. Koeneman, Department of Biostatistics, University of Iowa. Completed Spring, 2020.
- “Predictive Efficacy and Analysis of Conviction Rates for Alcohol Involved Motorcycle Crashes,” Ali Charlson Zorn, Department of Biostatistics, University of Iowa. Completed Spring, 2020.
- “Multiple Comparisons: A Bayesian Model Selection Approach (With An Application to the Effect of State Policy in Reducing Disparities in Bullying),” Javier E. Flores, Department of Biostatistics, University of Iowa. Completed December, 2017.
- “Using Structural Equation Modeling to Examine Factors Influencing Dental Caries in Adolescents,” Alexandra Curtis, Department of Biostatistics, University of Iowa. Completed November, 2016.
- “An Analysis of Youth Football Injury Data,” Benjamin N. Riedle, Department of Biostatistics, University of Iowa. Completed April, 2015.

- “A Longitudinal Analysis of the Effect of Long–Term Dosing of Testosterone Cypionate on Body Weight and Lipid Profiles in Healthy Male Volunteers,” Youwei Bi, Department of Biostatistics, University of Iowa. Completed December, 2014.
- “Modeling the Evidence in a Triangle Plot: Informative Dropout and Longitudinal Data,” Anne Welhaven, Department of Biostatistics, University of Iowa. Completed May, 2013.
- “Analysis of Bullying Data from the Iowa Youth Survey Using Generalized Linear Mixed Models,” Patrick Ten Eyck, Department of Biostatistics, University of Iowa. Supervised with Marizen Ramirez. Completed December, 2012.
- “The Public Health Burden of Influenza: Clustering, Modeling, and Predicting Incidence for Diseases Associated with the Flu,” Fan Tang, Department of Biostatistics, University of Iowa. Supervised with Eric Foster. Completed December, 2012.
- “Time Series Modeling and Forecasting of US Lyme Disease Incidence, 1998–2009,” Brett M. Forshey, Department of Biostatistics, University of Iowa. Completed April, 2012.
- “A Case Control Study of *Clostridium Difficile* Risk Factors: The Inferential Consequences of Model Misspecification,” Mitchell Thomann, Department of Biostatistics, University of Iowa. Completed December, 2010.
- “Characterization and Prediction of Mortality from Influenza Using Influenza–Like Illness and Laboratory Culture Data,” Eric D. Foster, Department of Biostatistics, University of Iowa. Completed December, 2009.
- “The Effects of Familial Loading in Bipolar Disorder.” Tao Zhang, Department of Biostatistics, University of Iowa. Supervised with Jess Fiedorowicz. Completed December, 2009.
- “Modeling Zero–Inflated Count Time Series with an Application to Infectious Diseases,” Ming Yang, Department of Biostatistics, University of Iowa. Supervised with Philip Polgreen. Completed May, 2009.
- “Specialty versus General Care for Hospitalized AMI Patients: An Analysis Based on Hierarchical Modeling,” Levent Bayman, Department of Biostatistics, University of Iowa. Supervised with Dawei Liu. Completed May, 2009.
- “Extubation for Ventilated Patients: An Investigation for Better Decision Making,” Amy Johnson, Department of Biostatistics, University of Iowa. Completed April, 2009.
- “A Spatial Analysis of the Iowa Child Passenger Safety Survey Based on Generalized Linear Mixed Models,” Zunqiu Chen, Department of Biostatistics, University of Iowa. Completed April, 2008.
- “A Spatial Analysis of the 2006 Iowa Mumps Epidemic Using Generalized Linear Mixed Models: Were College Students to Blame?,” Lucas Bohnett, Department of Biostatistics, University of Iowa. Supervised with Philip Polgreen. Completed December, 2007.
- “Tooth Loss in the South Australian Dental Longitudinal Study,” Knute Carter, Department of Biostatistics, University of Iowa. Completed December, 2007.
- “Analysis of Iowa Child Passenger Restraint Survey,” Jing Xu, Department of Biostatistics, University of Iowa. Completed May, 2007.

- “Combining Statistical Modeling and Map Analysis in Population Health Research – A Case Study of Infant Mortality in Des Moines, Iowa,” Qiang Cai, Department of Biostatistics, University of Iowa. Completed December, 2006.
- “*Clostridium Difficile*–Associated Disease Among Patients in a Small Rural Hospital,” Laura K. Becker, Department of Biostatistics, University of Iowa. Completed November, 2006.
- “Factors that Affect Retention of Family Practice Physicians in Rural Iowa Communities,” Jaysri Butler, Department of Biostatistics, University of Iowa. Completed April, 2005.

#### MASTER’S PROJECTS DIRECTED

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- “A Simulation Study of Population–Averaged Generalized Estimating Equations,” Gerwyn H. Green, Department of Statistics, University of Missouri. Completed March, 2004.
- “A Diagnostic for Assessing the Influence of Cases on the Prediction of Random Effects in a Mixed Model,” Junfeng Shang, Department of Statistics, University of Missouri. Completed April, 2003.
- “An Analysis of Mortality Data by Race and Gender for Boone County, Missouri,” Tamekia L. Jones, Department of Statistics, University of Missouri. Completed December, 2002.
- “Model Selection Criteria Based on Kullback–Leibler Information for Multiple Linear Regression,” Simon L. Davies, Department of Statistics, University of Missouri. Completed August, 2000.
- “Modeling Resource Utilization and Evaluating Injury Severity Scores Based on Missouri Trauma Patient Records,” Gaixin Jiang, Department of Statistics, University of Missouri. Completed April, 2000.
- “An Adaptive, Robust and High Performance Clustering Method,” Xiaohu Li, Department of Statistics, University of Missouri. Completed July, 1999.
- “Trauma Scoring Systems and Their Statistical Evaluation,” Ashley K. Sherman, Department of Statistics, University of Missouri. Completed April, 1999.
- “A Diagnostic for Assessing the Influence of Cases on the Prediction of Missing Data,” Jacob J. Oleson, Department of Statistics, University of Missouri. Completed April, 1999.
- “Time Series Spectral Discriminants Based on Kullback Information Measures (with an Application to Seismology),” Kristin Hedberg, Department of Statistics, University of Missouri. Completed December, 1998.
- “Bootstrap Variants of the Akaike Information Criterion for Model Selection with Applications to Linear Regression,” Hyun–Joo Kim, Department of Statistics, University of Missouri. Completed April, 1998.
- “Internet Accessible Educational Aids for Autoregressive Moving–Average Modeling in Time Series Analysis,” Aaron T. Bono, Department of Statistics, University of Missouri. Completed December, 1997.
- “An Investigation of Lagrange Multiplier Tests for the Interaction Between Autocorrelation and Conditional Heteroscedasticity in an Error Process,” Wei Zhang, Department of Statistics, University of Missouri. Completed December, 1996.
- “The EM Algorithm for Repeated Measures Designs,” Daniel B. Smith, Department of Statistics, University of Missouri. Completed May, 1995.

## PROFESSIONAL ACTIVITIES: INTERNAL

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- Executive Committee member for the College of Public Health, University of Iowa (November, 2014 – present).
- Executive Committee member for the Injury Prevention Research Center, University of Iowa (January, 2006 – present).
- Faculty mentor for the Iowa Summer Institute in Biostatistics, University of Iowa (summer 2011 – present).
- Member of the Admissions and Student Recruitment Committee for the Department of Biostatistics, University of Iowa (2006 – 2015, 2017 – present). Served as chair from 2006 to 2012.
- Chair of the Student Awards Committee, Department of Biostatistics, University of Iowa (2017 – present). Served as a committee member from 2012 to 2017.
- Member of the Colloquium Committee, Department of Biostatistics, University of Iowa (2014 – present).
- Member of the Ph.D. Comprehensive Examination Steering Committee, Department of Biostatistics, University of Iowa (2005 – present). Served as chair in 2014.
- Member of the Departmental Executive Officer search committee for the Department of Occupational and Environmental Health, College of Public Health, University of Iowa (October, 2022 – present).
- Served as co-chair of the Ph.D. Comprehensive Examination Review Committee, Department of Biostatistics, University of Iowa (2019 – 2021).
- Served as co-chair of the Ph.D. Curriculum Review Committee, Department of Biostatistics, University of Iowa (2016 – 2019).
- Served as a mentor for the University of Iowa Sloan Center for Exemplary Mentoring (January, 2014 – May, 2021).
- Served as a member of faculty search committees for the Department of Biostatistics, University of Iowa, for the following academic years: 2003 – 2004, 2006 – 2007, 2008 – 2009, 2011 – 2012, 2013 – 2014, 2014 – 2015, 2016 – 2017, 2018 – 2019. Served as co-chair for 2016 – 2017 and for 2018 – 2019.
- Served as chair of the Departmental Executive Officer search committee for the Department of Occupational and Environmental Health, College of Public Health, University of Iowa (November, 2020 – October, 2021).
- Served as co-chair of the College of Public Health Dean Search Committee, University of Iowa (July, 2017 – April, 2018).
- Served as chair of the Awards Committee, College of Public Health, University of Iowa (2009 – 2015). Committee member from 2004 to 2015.
- Served as chair of the committee to revise the Ph.D. Comprehensive Examination, Department of Biostatistics, University of Iowa (2012 – 2013).
- Served as an elected member of the Promotion and Tenure Collegiate Consulting Group, College of Public Health, University of Iowa (2010 – 2014).

- Served as a member of the Institute for Clinical and Translational Science, University of Iowa; Biostatistician for the Research Education, Training and Career Development Key Function (July, 2009 – May, 2014).
- Served as a biostatistician for the College of Dentistry, University of Iowa (August, 2005 – June, 2009).
- Served as the Associate Director for Biostatistics for the Center on Aging, University of Iowa (November, 2003 – June, 2009).
- Served as a member of the Departmental Executive Officer search committee for the Department of Community and Behavioral Health, College of Public Health, University of Iowa (2008 – 2009).
- Served as a biostatistician for the Iowa Scholars in Clinical Investigation program at the University of Iowa (October, 2004 – September, 2007).
- Served as a member of an internal College of Public Health review committee to evaluate the Department of Health Management and Policy at the University of Iowa (2005).
- Served as the faculty Advisor to the Statistics Graduate Student Association (SGSA), Department of Statistics, University of Missouri (1995 – 2003).
- Served as a member of the Research Council of the University of Missouri (winter semester, 2003).
- Designed the bachelor's degrees in Applied Statistics at the University of Missouri. (First offered during the 2001 – 2002 academic year.)

#### PROFESSIONAL ACTIVITIES: EXTERNAL

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- Evaluated promotion and/or tenure cases for faculty candidates at Clemson University (2011, 2016), Cleveland Clinic (2020), Colorado School of Public Health (2013, 2017), Colorado State University (2021), Columbia University (2001, 2007), Connecticut College (2009), East Tennessee State University (2015, 2021), Georgetown University (2014), Indiana University (2020), Mayo Clinic (2018), Montana State University (2010), Michigan State University (2019), National Technical University of Athens (2014), New York University (2013, 2019), Oregon State University (2016), Pomona College (2011), Seoul National University (2019), Southern Illinois University – Edwardsville (2005), Towson University (2015, 2018, 2019), Texas A&M University (2021), Trinity University (2021), University at Buffalo (2011, 2019), University of Cyprus (2013), University of Florida (2018), University of Georgia (2014), University of Kansas (2009, 2011, 2016, 2021), University of Maryland, Baltimore County (2011, 2014), University of Massachusetts – Amherst (2020), University of Michigan (2015, 2019), University of Missouri (2010, 2019), University of New Mexico (2015, 2022), University of North Carolina at Chapel Hill (2021), University of Wisconsin – Milwaukee (2020).
- Mentor for the National Alliance for Doctoral Studies in the Mathematical Sciences (April, 2015 – present).
- Member of the Spanish National Biostatistics Network (BIOSTATNET) (September, 2011 – present).
- Serve on the American Statistical Association Committee to select the annual recipient of the Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society (2019 – present). Served as chair from 2019 to 2021.

- Led the University of Iowa College of Public Health COVID–19 Response Group in modeling COVID–19 incidence, hospitalizations, and mortality for the Iowa Department of Public Health (March, 2020 – May, 2020).
- Served as a reviewer for the Board of Regents, University System of Georgia, to evaluate a proposed doctoral program in Biostatistics at the University of Georgia (February, 2013).
- Served on a three–member advisory committee to the Kansas Board of Regents to evaluate proposed graduate programs in Biostatistics at the University of Kansas (June, 2009).
- Served on Data Safety Monitoring Boards for a multicenter intervention study coordinated at the University of Iowa (2009 – 2013), and for a phase I clinical trial conducted at the University of Kansas (2008 – 2013).
- Participated in the redesign of the Iowa Child Passenger Restraint Survey, conducted by the University of Iowa Injury Prevention Research Center for the Iowa Governor’s Traffic Safety Bureau (2005).
- Served on an independent expert panel to evaluate organ transplantation simulation models; Chicago, Illinois. Sponsored by the Division of Transplantation, Health Resources and Services Administration, U.S. Department of Health and Human Services (September, 2004).
- Served as the American Statistical Association (ASA) representative to the American Academy for the Advancement of Science (AAAS); Industrial Science and Technology Section (2002 – 2005). Attended the 2004 and 2005 annual meetings of the AAAS as an ASA representative; Seattle, Washington (2004) and Washington D.C. (2005).
- Served as a contributed poster judge at the 2003 Joint Statistical Meetings.
- Organized an invited session at the 2002 Joint Statistical Meetings for the Western North American Region of the Biometrics Society. Session theme: Biometrical Applications of Modern Time Series Methodologies.
- Served as Treasurer of the Mid–Missouri Chapter of the American Statistical Association (1995 – 2000, 2003).
- Served as President of the Mid–Missouri Chapter of the American Statistical Association (2000 – 2002).

## EDITORIAL ACTIVITIES

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- Associate Editor for the *Journal of Forecasting* (since October, 1999).
- Served two consecutive three-year terms as an Associate Editor for *The American Statistician* (June, 2011 – December, 2017).
- Served two consecutive three-year terms as an Associate Editor for the Reviews Section of the *Journal of the American Statistical Association* and *The American Statistician* (January, 2005 – December, 2010).

- Referee for *Afrika Statistika*, *The American Statistician*, *Annals of Applied Statistics*, *Annals of the Institute for Statistical Mathematics*, *Atmospheric Environment*, *Australian and New Zealand Journal of Statistics*, *Automatica*, *Bayesian Analysis*, *Bernoulli*, *Biometrics*, *Biostatistics*, *Canadian Journal of Statistics*, *Circulation*, *Communications in Statistics – Theory and Methods*, *Computational Statistics*, *Computational Statistics and Data Analysis*, *Epidemiology and Infection*, *Geophysical Research Letters*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Neural Networks*, *IEEE Transactions on Reliability*, *IEEE Transactions on Signal Processing*, *IEEE Transactions of Systems and Circuits I*, *Johns Hopkins APL Technical Digest*, *Journal of the American Statistical Association*, *Journal of Applied Meteorology and Climatology*, *Journal of Applied Statistics*, *Journal of Computational and Graphical Statistics*, *Journal of Forecasting*, *Journal of Multivariate Analysis*, *Journal of Nonparametric Statistics*, *Journal of Statistical Computation and Simulation*, *Journal of Statistical Planning and Inference*, *Journal of Time Series Analysis*, *Metrika*, *Psychometrika*, *Scandinavian Journal of Statistics*, *Sankhyā A: The Indian Journal of Statistics*, *Signal Processing*, *South African Statistical Journal*, *Statistica Neerlandica*, *Statistica Sinica*, *Statistical Modelling*, *Statistics*, *Statistics & Probability Letters*, *Statistics in Medicine*, *Statistics Surveys*, *Stochastic Environmental Research & Risk Assessment*, *Technometrics*, and the collections *Modeling and Prediction: Honoring Seymour Geisser*, *Statistical Methods for Modeling Human Dynamics: An Interdisciplinary Dialogue*, *Statistical Models and Methods for Biomedical and Technical Systems*.
- Reviewer for grant proposals submitted to the National Science Foundation, National Security Agency, the University of Iowa College of Public Health / College of Medicine New Investigator Program, the University of Missouri Research Board, and the Professional Staff Congress – City University of New York Research Award Program.
- Chosen as an “Outstanding Reviewer” for 1999 by the editorial board of *Automatica*.
- Publisher reviewer for *Advanced Linear Modeling (Second Edition)* by Ronald Christensen (2001; Springer, New York).

## PROFESSIONAL SOCIETIES

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- American Statistical Association (Elected Fellow, 2014)
- International Statistical Institute (Elected Member, 2019)
- International Biometric Society
- Institute of Mathematical Statistics