

BIOGRAPHICAL SKETCH

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NAME: Jacob J. Oleson

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

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	Completion Date MM/YYYY	FIELD OF STUDY
Central College	B.A.	1997	Mathematics
University of Missouri – Columbia	M.A.	1999	Statistics
University of Missouri – Columbia	Ph.D.	2002	Statistics

A. Personal Statement

I serve as the statistical consultant on this proposal. As a Professor in the Department of Biostatistics, College of Public Health, University of Iowa and the Director of the Center for Public Health Statistics, I conduct both biostatistical methodologic research and collaborative clinical research. Over the past decade, I have served as the lead biostatistician on numerous hearing, speech, and language related projects including Dr. Leibold’s previous grant developing a clinical tool for English and Spanish speech recognition, but also the cochlear implant project at the University of Iowa, Outcomes of Children with Hearing Loss, Complex Listening Skills in School-Age Hard of Hearing Children, Outcomes for School-Aged Children who are Hard of Hearing, Memory and Word Learning. In these research studies I work closely with all team members on study design, statistical methods, analysis, and results. This experience includes longitudinal, cohort, factor analysis, mixed models, growth curves, Bayesian methods, and missing data analyses. The collaborations also lead to methodologic work in biostatistics including PhD dissertations on functional data analysis, growth curves, and visual world paradigm data which stems from longitudinal data routinely collected in hearing impairment studies. I look forward to this collaboration with Dr. Leibold and the entire team on this important research. Below are four recent papers directly related to the work outlined in this proposal based on statistical methods proposed in this study. Notably, this work highlights my expertise in analyses with special populations, word learning studies, and evaluating multiple types of masking assessment which are all integral to the current proposal.

Ongoing projects to highlight:

P50 DC000242

PI: Gantz, Role: Co-Investigator
Iowa Cochlear Implant Clinical Research Center Project VII
9/9/85-11/30/22

96441-A

PI: McGregor, Role: Sub-Award PI
The Dynamics of Word Learning in Children with Developmental Language Impairment
1/23/12-6/30/22

R01 DC008089

PI: McMurray, Role: Co-Investigator

The Development of Real Time Spoken and Written Word Recognition: Cognitive Bases of Language and Educational Outcomes

1/8/07-11/30/23

96433-B / R01 DC015056

PI: Leibold, Role: Sub-Award PI

A Test of Children's English/Spanish Speech Perception in Noise or Speech Maskers

8/10/16-7/31/21

96399-A / R01 DC013591

PI: Walker, Role: Co-Investigator

Complex Listening Skills in School Age Children Who are Hard of Hearing

8/1/19-7/31/24

Citations:

1. Caladrucchio L, Beninate I, **Oleson JJ**, Miller M, Leibold LJ, Buss E, Rodriguez BL. A simplified approach to quantifying a child's bilingual language experience. American Journal of Audiology. (Accepted) 2021. No PMID
2. Buss E, Calandrucchio L, **Oleson J**, Leibold L. Contribution of stimulus variability to word recognition in noise vs two-talker speech for school-age children and adults. Ear and Hearing, 42(2):313-322, 2020. PMC: PMC7897187
3. Vicente M, Miller M, Browning J, **Oleson J**, Leibold LJ. Language proficiency and dominance considerations when working with Spanish-English bilingual adults. The American Journal of Audiology, 28(3):724-729, 2019. PMC: PMC6808312
4. Miller MK, Calandrucchio L, Buss E, McCreery RW, **Oleson J**, Rodriguez B, Leibold LJ. Comparing masked English speech recognition performance in younger and older Spanish-English bilingual and monolingual children. Journal of Speech, Language, and Hearing Research. 62(12), 4578-4591, 2019. PMID: PMC7839054

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2018-present	Professor, Dept. of Biostatistics, University of Iowa, Iowa City, IA
2015-present	Director of Graduate Studies, Dept. of Biostatistics, University of Iowa, Iowa City, IA
2014-present	Director, Center for Public Health Statistics, College of Public Health, University of Iowa
2012-2018	Associate Professor, Dept. of Biostatistics, University of Iowa, Iowa City, IA
2004-2012	Assistant Professor, Dept. of Biostatistics, University of Iowa, Iowa City, IA
2002-2004	Assistant Professor, Dept. of Math and Statistics, Arizona State University, Tempe, AZ

Honors

2020	Editor's Award for <i>Ear and Hearing</i> article
2020	Faculty Research Award, College of Public Health
2019	Faculty Service Award, College of Public Health
2016	Special Recognition Award to the Outcomes in Children with Hearing Loss Supplement, Editors of <i>Ear and Hearing</i>
2015	Elected to Delta Omega (Public Health Honor Society)
2013	Thank a Teaching Note of Appreciation, Center for Teaching
2013	2012 ASHA Editor's Award for the American Journal of Audiology, American Speech-Language-Hearing Association
2012	Top Cited Paper Impact Factor for 2011, Audiology & Neurotology
2012	Faculty Teaching Award, College of Public Health
2009	One of the Best 2008 Audiology Literature: Cochlear Implants
2008	Thank a Teacher Note of Appreciation, Center for Teaching

Professional Memberships

American Statistical Association
Institute of Mathematical Statistics
International Biometric Society (ENAR)
American Cochlear Implant Alliance

C. Contributions to Science

I collaborate extensively with researchers in speech and language development. Again, I work closely with all research team members on study design, implementation, analysis, and reporting of results. It was recognized that research on children who are hard of hearing was lacking, and that a study comparing various aspects of development of hard of hearing children against normal hearing children and children wearing cochlear implants was needed. This work has validated the effectiveness of newborn screening and the importance of timeliness in follow-ups. The work has also shed light on hearing aid fittings, consistency of hearing aid use, accuracy of parent reports of hearing aid use, risk and resilience in speech and language, and early literacy skills. The work is leading to a “best practice” guide for clinicians and service providers around the nation.

- **Oleson JJ**, Brown GD, McCreery R. The Evolution of Statistical Methods in Speech, Language, and Hearing Sciences. Journal of Speech, Language, and Hearing Research 62, 498-506, 2019. PMID: PMC6802903
- Wasiuk PA, Lavandier M, Buss E, **Oleson J**, Calandruccio L. The effect of fundamental frequency contour similarity on multi-talker listening in older and younger adults. Journal of the Acoustical Society of America 148(6): 3527-3543, 2020. PMID: PMC7863686
- Hendrickson K, **Oleson J**, Walker E. School-aged children adapt the dynamics of lexical competition in suboptimal listening conditions. Child Development. 2020. <https://doi.org/10.1111/cdev.13530> No PMID
- McGregor K, Eden N, Arbisi-Kelm T, **Oleson JJ**. The fast mapping abilities of adults with developmental language disorder. Journal of Speech, Language, and Hearing Research. 63(9): 3117-3129, 2020. PMID: PMC7890218

I am the lead biostatistician for the Cochlear Implant Research Center at the University of Iowa. The University of Iowa has been at the forefront of cochlear implant research for more than three decades. My role for this research center is to oversee research design, implementation, analysis, and interpretations. I work closely with all team members on the cochlear implant research studies. The sample sizes in many of these analyses are typically very small with multiple observations per subject. Modern cochlear implants preserve residual acoustic hearing during the implantation giving individuals with higher levels of pre-operative residual hearing the ability to be implanted with this remarkable device.

- Tejani VD, Kim JS, **Oleson JJ**, Abbas PJ, Brown CH, Hansen MR, Gantz BJ. Residual electrocochleography responses in electric acoustic stimulation cochlear implant users with complete loss of acoustic hearing post-implant. Journal of the Association for Research in Otolaryngology. 2021. Online ahead of print. PMID: PMC7943691
- Dunn CC, Stangl E, **Oleson J**, Smith M, Chipara O, Wu YH. The influence of COVID-19 on the auditory ecology of listeners with cochlear implants: *In situ* and retrospective questionnaire comparisons. Ear and Hearing. (Accepted) 2020. PMID: PMC7773050
- Jorgensen EJ, Stangl E, Chipara O, Hernandez H, **Oleson J**, Wu YH. GPS predicts stability of listening environment characteristics in one location over time among older hearing aid users. International Journal of Audiology. (Accepted) 2020. No PMID
- Dunn CC, **Oleson JJ**, Parkinson A, Hansen MR, Gantz B. Nucleus Hybrid S12: Multi-Center Clinical Trial Results. The Laryngoscope 130(10):E548-E558, 2020. PMID: PMC7728297

My work in Bayesian spatio-temporal models has primarily been geared towards sparse data, which include excessive zero values and missing data. The conditional auto-regression (CAR) models relate similar regions on a spatial scale. Today the work includes models for small areas for cancer rates where excessive number of small areas have zero counts. A former SIBS student is working on developing models to calculate age adjusted rates under this scenario using a hurdle model. The work also includes Bayesian mediation analysis.

We are also working on point process spatial models when surveillance includes residential address and we can utilize individual level data rather than less accurate aggregated data.

- Jay M, **Oleson JJ**, Charlton M, Arab A. A Bayesian approach for estimating age-adjusted rates for low prevalence diseases over space and time. Statistics in Medicine. Accepted 2021. No PMID
- Zahrieh D, **Oleson JJ**, Romitti P. Bayesian point process modeling to quantify geographic regions of excess stillbirth risk. Geographical Analysis 51, 381-400, 2019. No PMID
- Ward C, **Oleson JJ**, Jones K, Charlton M. Showcasing cancer incidence and mortality in rural ZCTAs using risk probabilities via spatio-temporal Bayesian disease mapping. Applied Spatial Analysis and Policy 12, 907-921, 2019. No PMID
- **Oleson JJ**, He CZ. Space-time modeling for the Missouri Turkey Hunting Survey. Environmental and Ecological Statistics, 11:85-101, 2004. No PMID

My work in infectious diseases has centered around modeling and predicting the spread of infectious diseases. Our work has involved predicting the avian flu outbreak in 2015, various improvements to Susceptible-Exposed-Infectious-Removed (SEIR) models including path-specific rate of change in the latent and infectious periods. We also developed improvements to calculating the basic reproductive number showcased with the Ebola outbreak in West Africa. We are developing multiple species SEIR models for diseases such as Leishmaniasis that are spread between people and dogs via a sandfly vector. Today we continue expanding that methodology using outbreaks of mumps and the current COVID-19 pandemic.

- Brown G, **Oleson JJ**, Porter AT (2015) An Empirically Adjusted Approach to Reproductive Number Estimation for Stochastic Compartmental Models: A Case Study of Two Ebola Outbreaks. Biometrics, 72(2), 335-343. No PMID
- Brown GD, Porter AT, **Oleson JJ**, Hinman, J. Approximate Bayesian computation for spatial SEIR(S) epidemic models. Spatial and Spatio-Temporal Epidemiology, 24:27-37, 2018. PMID: PMC5806152
- Ozanne M, Brown G, Toepp A, Scorza B, **Oleson J**, Wilson M, Petersen C. Bayesian compartmental models and associated reproductive numbers for an infection with multiple transmission models. Biometrics. 76: 711-721, 2020. No PMID
- Ward C, Brown GD, **Oleson JJ**. An individual level infectious disease model in the presence of uncertainty from multiple, imperfect diagnostic tests. Biometrics. 2021. No PMID