LUKE HAGAR

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*Please see the final page of this CV for a list of acronyms

RESEARCH INTERESTS

Experimental Design, Bayesian Methods, Computational Inference, Prior Elicitation, Dependence Modeling

CURRENT POSITION

Postdoctoral Research Fellow (07/2026 – present)
University of British Columbia, Department of Statistics, Vancouver, Canada (Advisor: Paul Gustafson)

PAST ACADEMIC POSITIONS

Research Officer (09/2025 – 05/2026)
University of Queensland, Clinical Trials Capability (ULTRA), Brisbane, Australia (Advisor: Andrew Martin)

Postdoctoral Scholar (09/2024 – 08/2025)
McGill University, Department of Epidemiology, Biostatistics & Occupational Health, Montréal, Canada (Advisor: Shirin Golchi)

EDUCATION

University of Waterloo, Waterloo, Canada

PhD in Statistics, Department of Statistics & Actuarial Science 09/2021 – 08/2024

- Thesis: *Design with Sampling Distribution Segments*
- Advisor: Nathaniel Stevens

MMATH in Statistics, Dept. of Statistics & Actuarial Science 09/2020 – 08/2021

- Master's Research Paper: *A More Comprehensive Framework for Binary Response Experiments Using Comparative Probability Metrics*

BMATH in Mathematical Optimization & Statistics (Co-op) 09/2015 – 04/2020

PEER-REVIEWED PUBLICATIONS

Published & Accepted

18. **L. Hagar** and A.J. Martin. (2026+). An efficient framework for robust sample size determination. Accepted to *Statistical Methods in Medical Research*. arXiv.
17. S. Kaminskaïa and **L. Hagar**. (2026+). Variation et changement dans le rythme phonétique en français ontarien minoritaire. Accepted to *Linx*.
16. **L. Hagar**, S. Golchi, and M.B. Klein. (2026+). Group sequential design with posterior and posterior predictive probabilities. *Journal of the American Statistical Association*, in press. DOI.
15. **L. Hagar** and N.T. Stevens. (2026). Posterior ramifications of prior dependence structures. *Statistical Science 41*(3): 507-523. DOI.
14. **L. Hagar** and N.T. Stevens. (2026). Design of Bayesian A/B tests controlling false discovery rates and power. *Journal of Business and Economic Statistics 44*(3): 955–964. DOI.
13. S. Kaminskaïa and **L. Hagar**. (2026). Language use and articulation rate in a minority French community. In *Proceedings of Speech Prosody 2026*, 289–293. DOI.
12. **L. Hagar** and S. Golchi. (2026). Design of Bayesian clinical trials with clustered data. *Statistics in Medicine 45*(6-7), e70488. DOI.
11. **L. Hagar** and N.T. Stevens. (2026). Fast power curve approximation for posterior analyses. *Bayesian Analysis 21*(1), 255–280. DOI.
10. S. Kaminskaïa and **L. Hagar**. (2025). Acquisition of temporal aspects of speech by Canadian English learners of French with previous core vs. immersion backgrounds. *Canadian Journal of Applied Linguistics 28*(3), 181–214. DOI.
9. **L. Hagar** and N.T. Stevens. (2025). An economical approach to design posterior analyses. *Journal of the American Statistical Association 120*(552), 2559–2568. DOI.

8. S. Kaminskaïa and **L. Hagar**. (2025). A complex approach to rhythm in a minority French community. *LACUS Forum 50*(3), 1–14. DOI.
7. W. Cichocki, S. Kaminskaïa, and **L. Hagar**. (2025). The relationship between articulation rate and utterance length in varieties of Canadian French. *LACUS Forum 50*(1), 13–26. DOI.
6. **L. Hagar** and N.T. Stevens. (2025). Bioequivalence design with sampling distribution segments. *Statistics in Medicine 44*(3-4), e10321. DOI. R Package.
5. S. Kaminskaïa, **L. Hagar**, N. Gadbois, and J.C. Van Leeuwen. (2025). It doesn't sound French, or does it? In *15th Annual PSSLT Proceedings*, 1–11. DOI.
4. A. Deng, **L. Hagar**, N.T. Stevens, T. Xifara, and A.K. Gandhi. (2024). Metric decomposition in A/B tests. In *Proceedings of the 30th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 4885–4895. DOI.
3. W. Cichocki, S. Kaminskaïa, and **L. Hagar**. (2024). Regional variation in articulation rate in French spoken in Canada. *Journal of the International Phonetics Association 54*(1), 126–145. DOI.
2. N.T. Stevens and **L. Hagar**. (2022). Comparative probability metrics: Using posterior probabilities to account for practical equivalence in A/B tests. *The American Statistician 76*(3), 224–237. DOI. R Shiny App 1, R Shiny App 2.
1. L. Lu, C.M. Anderson-Cook, N.T. Stevens, and **L. Hagar**. (2022). Using a baseline with the probability of agreement to compare distribution characteristics. *Quality Engineering 34*(3), 322–343. DOI. R Shiny App.

Submitted for Publication († denotes co-first authorship)

6. **L. Hagar** and P. Gustafson. (2026+). Bayesian sample size determination: Sampling distribution estimation or exploration? Submitted to *The American Statistician*, 09/2026. arXiv.
5. **L. Hagar** and N.T. Stevens. (2026+). An economical approach to design with precision criteria. Submitted to *Journal of the American Statistical Association*, 09/2026. arXiv.
4. **L. Hagar** and J.M. McGree. (2026+). Computationally efficient experimental design with generalized posteriors. Revision submitted to *Bayesian Analysis*, 09/2026. arXiv.
3. **L. Hagar**, M. Zhang, R. Thomas, and A.J. Martin. (2026+). COBRA-DOSE: Copula-based Bayesian model averaging for dose selection. Submitted to *Biostatistics*, 08/2026. arXiv. R Package.
2. S. Golchi and **L. Hagar**. (2026+). Bayesian design of clinical trials in the presence of nuisance parameters. Submitted to *Econometrics and Statistics*, 08/2026. arXiv.
1. **L. Hagar**†, L. Maleyeff†, S. Golchi, and D. Menzies. (2026+). Efficient sample size determination for Bayesian platform trials. Revision submitted to *Journal of the Royal Statistical Society (Series C)*, 06/2026. arXiv.

Research Funding As PI

$14,773	AusTriM Seed Funding Grant (2026) • Co-investigators: Andrew Martin, Min Zhang, Ranjeny Thomas
$140,000	NSERC Postdoctoral Fellowship (2024 – 2025, 2026 – 2027)
$42,000	CRM StatLab - CANSSI Postdoctoral Fellowship (Declined, 2024 – 2025)
$63,000	NSERC Postgraduate Scholarship – Doctoral (2021 – 2024)
$15,000	Ontario Graduate Scholarship (Declined, 2021 – 2022)
$17,500	NSERC Canada Graduate Scholarship – Master's (2020 – 2021)
$4,500	NSERC Undergraduate Student Research Award (2019)

Scholarships & Awards

$1,000	UW Mathematics Doctoral Prize - Second Place (2025)
	• This award recognizes graduating doctoral students in UW's Faculty of Mathematics. Each department nominates one student.
$7,500	ASQ Ellis R. Ott Scholarship for Applied Statistics & Quality (2024)
	• This award and the next recognize excellence in academics, teaching, and leadership in the applied statistics community.
$3,500	ASA Mary G. and Joseph Natrella Scholarship (2024)
$3,000	UW SAS Scotiabank Scholarship
	• This award recognized course coordination efforts when teaching STAT 341.
$45,000	UW President's Graduate Scholarship (2020 – 2024)
$1,000	UW SAS Chair's Award (2021 – 2024, $\times$ 5)
$1,000	UW SAS Sprott Scholarship (2023)
	• This award recognizes PhD students in UW's SAS Department who show particular promise in research prior to their thesis defence.
$500	UW SAS Teaching Assistant Award (2023)
	• This award recognizes teaching assistants whose contributions result in an improvement of the student academic experience.
$1,000	UW SAS Comprehensive Exam Award (2022)
	• This award recognizes top performance on the PhD comprehensive exam in UW's SAS Department.
$5,000	UW SAS Doctoral Entrance Award (2021 – 2022)
	• This award is for new PhD students with top academic standing.
$1,000	UW SAS Outstanding Academic Performance Award (2021)
	• This award is presented to the student(s) with the highest academic performance in the first two terms of their MMath program.
$5,000	UW President's Scholarship of Distinction (2015 – 2020)
$500	UW Scott Kelsey Fevreau Memorial Award (2017)
	• This student award is given based on high academic achievement, extracurricular activities, and personal characteristics.
$1,500	St. Jerome's University Robert & Margaret Forwell Scholarship (2016)
	• This award recognizes a student involved in the St. Jerome's community who demonstrates academic and leadership excellence.

Student Supervision

Co-Supervision

- Maryanne Cleetus (PhD in Epidemiology, UQ) 04/2026 – present
  Co-Supervisors: Bec Jenkinson, Nadine Foster

Presentations

Invited Seminars and Conference Presentations

20. [Upcoming] *Computationally Efficient Bayesian Adaptive Trial Design with Generalized Posteriors*. ISCB Conference, Rotterdam (The Netherlands), 08/2027.
19. [Upcoming] *Bayesian Sample Size Determination: Sampling Distribution Estimation or Exploration?* SSC Annual Meeting, 06/2027.
18. *Copula-Based Bayesian Model Averaging for Dose Selection*. AusTriM Webinar, Hosted from Melbourne (Australia), 07/2026.
17. *Bayesian Design with False Discovery Rates and Power*. SSC Annual Meeting, 06/2026.
16. *Efficient and Robust Sample Size Determination*. Spring Research Conference, Clemson (USA), 05/2026.
15. *Robust Sample Size Determination for Clinical Trials*. NHMRC Clinical Trial Centre, Sydney (Australia), 05/2026.

14. *Economical Design with Posterior Probabilities*. Queensland University of Technology, Brisbane (Australia), 11/2025.
13. *Group Sequential Design with Posterior and Posterior Predictive Probabilities*. AusTriM Webinar, Hosted from Melbourne (Australia), 10/2025.
12. *Design of Bayesian Clinical Trials with Clustered Data*. Canadian Society for Epidemiology and Biostatistics Conference, 08/2025.
11. *Economical Computer Experiments for Sequential Design*. Quality and Productivity Research Conference, Seattle (USA), 06/2025.
10. *Economical Design of Sequential Bayesian Analyses*. SSC Annual Meeting, 05/2025.
9. *An Economical Approach to Design Posterior Analyses*. York University, 02/2025.
8. *Sample Size Determination in Bayesian Clinical Trials with Clustered Data*. McGill University, 02/2025.
7. *Design of Bayesian Clinical Trials with Clustered Data and Multiple Endpoints*. Canadian Network for Bayesian Adaptive Trials Webinar, 01/2025.
6. *Design of Posterior Analyses with Sampling Distribution Segments*. Computational and Methodological (CM)Statistics, London (UK), 12/2024.
5. *Scalable Bayesian Design for Business Innovation*. HEC Montréal, 11/2024.
4. *Scalable Design with Posterior-Based Operating Characteristics*. Joint Research Conference, 06/2024.
3. *A Bayesian Approach to Experimentation*. Airbnb AirAcademy Webinar Series. Hosted from San Francisco (USA), 11/2023.
2. *Targeted Sampling for Scalable Experimental Design*. ASQ CPID Webinar. Hosted from Milwaukee (USA), 11/2023.
1. *Using a Baseline with the Probability of Agreement to Compare Distribution Characteristics*. INFORMS Conference on Quality, Statistics, and Reliability, Raleigh (USA), 06/2023.

Contributed Presentations

18. *An Economical Approach to Design with Precision Criteria*. Fall Technical Conference, Charlotte (USA), 10/2026.
17. *Economical Sample Size Calculations for Complex Designs*. Joint Statistical Meetings, Nashville (USA), 08/2025.
16. *Fast Power Curve Approximation for Posterior Analyses*. Bayesian Young Statisticians Meeting. Hosted from Durham (USA), 04/2025.
15. *Fast Design of Posterior Analyses with Operating Characteristics*. ENAR Spring Meeting, New Orleans (USA), 03/2025.
14. *A Complex Approach to Minority French Rhythm*. LACUS Conference, 07/2024.
13. *The Relationship between Articulation Rate and Utterance Length in Canadian French: Data from Reading Style*. LACUS Conference, 07/2024.
12. *Quantile Estimation for Sampling Distributions of Posterior Probabilities*. SSC Annual Meeting, 06/2024.
    - Biostatistics Section Student Presentation Award Winner
11. *Engaging Assessments with Real Data Analysis in Undergraduate Statistics Courses*. UW Teaching and Learning Conference, 05/2024.
10. *Scalable Power Curve Approximation with Targeted Hypercube Sampling*. CANSSI Showcase, 11/2023.
9. *Scalable Power Curve Approximation with Targeted Hypercube Sampling*. Waterloo Student Conference in Statistics, Actuarial Science & Finance, 10/2023.
    - Presentation Award Winner

8. *Fast Sample Size Determination for Bayesian Equivalence Tests*. Joint Statistical Meetings, 08/2023.
7. *Fast Sample Size Determination for Two-Group Equivalence Tests with Unequal Variances*. ISBIS Conference, 07/2023.
6. *Fast Sample Size Determination for Two-Group Equivalence Tests with Unequal Variances*. SSC Annual Meeting, 05/2023.
5. *Fast Sample Size Determination for Bayesian Equivalence Tests*. University of Toronto Statistics Graduate Student Research Day, 04/2023.
4. *A More Computationally Tractable Approach to Bayesian Interval-Based Sample Size Determination*. SSC Annual Meeting, 05/2022.
3. *A More Computationally Tractable Approach to Bayesian Interval-Based Sample Size Determination*. UW SAS Research Presentation Day, 03/2022.
    - Presentation Award Winner
2. *A Framework for Sample Size Determination with Comparative Probability Metrics*. SSC Annual Meeting, 06/2021.
    - Business & Industrial Statistics Section Student Presentation Award Winner
1. *A More Comprehensive Framework for Binary Response Experiments Using Comparative Probability Metrics*. Canadian Statistics Student Conference, 06/2021.

Workshops

3. *Clinical Trial Concept Development Workshop*. University of Queensland, 02/2026.
2. *From MAMS to Bayesian Platforms: Bridging Theory and Practice*. HeRA ULTRA Showcase, 11/2025. Google Colab.
1. *Sample Size Calculations for Bayesian Clinical Studies*. University of Toronto Health Data Working Group, 04/2025. GitHub.

Research Experience

Academic Collaborator, Airbnb 09/2023 – present

- Navigated changing priorities to develop methods now applied at Airbnb (see *Paper #4*), leading to an invited talk for Airbnb executives and data scientists.

Consultant, UW Statistical Consulting & Survey Research Unit 01/2022 – 04/2023

- Guided clients on how to leverage sound statistical approaches in their analyses, with active research collaboration in enhanced service projects (see e.g., *Paper #3*).

Teaching Experience

McGill University, Montréal, Canada

Course Lecturer 08/2024 – 12/2024

- BIOS 612: Advanced Generalized Linear Models with 10 graduate students. Co-instructed with Shirin Golchi.

University of Waterloo, Waterloo, Canada

Sessional Lecturer 01/2024 – 04/2024

- STAT 341: Computational Statistics & Data Analysis with 125 undergraduates. Coordinated two sections with 250 students and managed 6 teaching assistants.

TA Workshop Facilitator 01/2023 – 04/2024

- Facilitated and developed interdisciplinary teaching workshops for graduate students with UW's Centre for Teaching Excellence.

TA Coordinator 09/2023 – 12/2023

- Co-developed a practicum component of the teaching assistant development program for the SAS department and conducted teaching observations for TAs.

Teaching Assistant 01/2017 – 08/2023

- STAT 938: Statistical Consulting (Spring 2023)
- STAT 430: Experimental Design (Spring 2021)
- STAT 341: Computational Statistics & Data Analysis (Winter 2021)
- COMM 421: Financial Statement Analysis (Winter 2021)
- STAT 443: Forecasting (Fall 2020)
- MATH 137: Calculus I (Fall 2017)
- MATH 138: Calculus II (Winter 2017)

Professional Development

Fellowships

- FDA-OCE-ASA Oncology Fellowship (2024 – 2025)

Certificates

- UW Certificate in University Teaching (2022 – 2023)
- UW New Instructor Foundations Program (2023)
- UW University Mathematics Teaching Techniques (2023)
- UW Fundamentals of University Teaching (2021)

Service Profile

External Roles

SSC Committee on New Investigators

- Chair (07/2026 – present)

ASQ CPID Leadership Team

- Chair (01/2026 - present)
- Chair-Elect (01/2025 - 12/2025)
- Secretary/Treasurer (01/2024 – 12/2024)
- Fall Technical Conference Publicity Chair (01/2023 – 12/2024)

SSC Community Connections Initiative

- Co-Organizer (12/2024 – 04/2026)

ZonMw Rational Pharmacotherapy Program

- Clinical Trial Reviewer (07/2026)

ASA Section on Bayesian Statistical Science

- Student Paper Competition Judge (12/2024, 12/2025)

SSC Student and Recent Graduate Committee

- Past Chair (07/2024 – 06/2025)
- Chair (07/2023 – 06/2024)
- Member (07/2022 – 06/2023)

SSC Canadian Student Statistics Conference

- Judge (06/2024, 05/2026)
- Co-chair (07/2022 – 06/2023)
- Scientific Program Co-coordinator (09/2021 – 06/2022)

Internal Roles

McGill (Bio)Statistics Research and Career Day

- Judge (05/2025)

UW Statistical Workshops and Applications Group

- Executive Team Member (06/2022 – 08/2023)

UW Math Faculty Graduate Studies Committee

- Elected Graduate Student Representative (05/2021 – 08/2023)

UW Math Faculty-Level Student Course Perceptions Working Group

- Graduate Student Representative (03/2022 – 03/2023)

St. Jerome's University Student Leadership Team

- Peer Academic Leader (09/2015 – 04/2017)

Conference Session Organizer

Invited Sessions

- *Recent Advances by New Investigators Across Canada*, SSC Annual Meeting (2027)
- *Bayesian Clinical Trials: Innovative Methods for Real-World Challenges*, International Biometric Conference (2026)
- *Bridging Theory and Practice in Experimental Design*, SSC Annual Meeting (2025)

Topic-Contributed Sessions

- *Economical Methods for Experimental Design*, Joint Statistical Meetings (2025)

Conference Session Chair

- Canadian Statistics Student Conference (2023), Fall Technical Conference (2026), Joint Research Conference (2024), LACUS Conference (2024), Quality and Productivity Research Conference (2025), SSC Annual Meeting (2022, 2023, 2025, 2027)

Editorial Activities

Reviewer

- *Banff International Research Station*, *Bayesian Analysis*, *Biometrics* (x4), *BMC Medical Research Methodology*, *Canadian Journal of Statistics* (x2), *Clinical Epidemiology*, *Computational Statistics* (x3), *Journal of Statistical Theory and Practice*, *Statistical Methods in Medical Research*, *Statistics in Medicine*, *The American Statistician* (x2), *Xenobiotica*

Acronyms

AusTriM	Australian Trials Methodology Research Network
ASA	American Statistical Association
ASQ	American Society for Quality
CANSSI	Canadian Statistical Sciences Institute
CPID	Chemical and Process Industries Division
CRM	Centre de recherches mathématiques
FDA	U.S. Food & Drug Administration
ENAR	Eastern North American Region (International Biometric Society)
ISCB	International Society of Clinical Biostatistics
INFORMS	Institute for Operations Research and the Management Sciences
ISBIS	International Society for Business and Industrial Statistics
LACUS	Linguistic Association of Canada and the United States
NHMRC	National Health and Medical Research Council
NSERC	Natural Sciences and Engineering Research Council
OCE	Oncology Center of Excellence
SAS	Statistics & Actuarial Science
SSC	Statistical Society of Canada
ULTRA	University of Queensland's cLincial TRials cApability
UW	University of Waterloo
UQ	University of Queensland
ZonMw	The Netherlands Organisation for Health Research & Development