

Christie Barron

Toronto, Ontario

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SUMMARY

Award-winning psychometrician and data analyst with extensive experience analyzing complex statistical information using multivariate statistics. Competencies encompass wrangling data, conducting detailed data analysis, and rigorous technical documentation and presentation of complex statistical information. 7 years of experience in data wrangling and analysis in higher-education settings conducting psychometrics to evaluate reliability and validity evidence (e.g., factor analysis, structural equation modeling, and item response theory).

SKILLS

Systems: R, Python, SQL, SSMS, GitHub, git, Quarto, PowerBI, Microsoft Office, Mplus

R packages: Tidyverse, ggplot2, rmarkdown, mplusAutomation, MIRT, GDINA, lavaan, lme4, eRm, gtheory

RELEVANT PROFESSIONAL EXPERIENCE

Data Analyst, University of Toronto

2023–present

- Authored a comprehensive psychometric research report, including advanced statistical analyses (multilevel factor analysis, g-theory) to support stakeholder interpretation of course evaluation data
- Regularly delivered presentations to technical and non-technical internal and external stakeholders, effectively communicating statistical model results and influencing data-driven decisions.
- Developed R scripts to automate time-consuming manual processes, including quality assurance checking, report generation, and data processing for dashboards.
- Taught technical workshops regarding data visualization, statistics, and quantitative methods

Psychometrics Research Assistant, University of Toronto

2017–2023

- Developed and validated an in-house computerized assessment with automated scoring.
- Wrote and maintained R program scripts to automate data cleaning and analysis for diagnostic classification modeling and explanatory item response theory analyses.
- Completed automated technical documentation and research summaries for a range of stakeholders using Quarto/RMarkdown, presenting findings to stakeholders for overall decision making.
- Developed and maintained automated dashboard feedback reports for assessment tasks, providing consultative advice to school administrators on policy implementation.
- Conducted diagnostic classification analysis of large-scale IELTS Reading assessment data using CDM R package, which was subsequently used to produce can-do descriptors to aid university admission.

Statistical and Research Methods Instruction, University of Toronto

2019–2023

- Developed content for and led 16 applied statistics and statistical programming workshops in topics such as factor analysis, structural equation modeling, mixture modeling, and R programming.
- Instructed 11 guest lectures on applied statistics and research methodology topics.
- Teaching assistant for latent variable modeling, intermediate statistics, and research methodology courses at the graduate level.

RELEVANT PROJECTS

Doctoral Dissertation, University of Toronto 2018–Present

- Conducting a 5-year multi-phase, multi-grant research project developing and evaluating a computerized phonological awareness assessment with automated speech recognition (ASR) based automated scoring.
- Utilizing an argument-based validity framework to integrate several types of psychometric modeling.
- Evaluating reliability and validity evidence using inter-rater reliability, classical test theory, moderated non-linear factor analysis and structural equation modeling.
- Completed literature review to identify and address gap in the literature.

Machine-Generated Text Detection, University of Toronto SCS 2023

- Leading a project employing natural language processing (NLP) to develop a filter model for automated essay scoring to identify machine-generated essays submitted to a computerized writing assessment.
- Developed an NLP pipeline in Python and SQL, generated essays using Hugging Face's Transformers library and OpenAI's API, extracted relevant essay features, and developed a series of data visualizations.
- Planning to deploy a classification model and create an interactive dashboard by August 2023.

RIFL-ECD Validation Project, University of Toronto 2021–2022

- Collaborated with content experts to design and implement item and test psychometric analysis.
- Conducted inter-rater reliability, CFA and IRT analyses as well as multilevel modeling to investigate validity evidence of an observational rating scale of education quality.
- Published results in Early Childhood Research Quarterly, a peer-reviewed journal.

COMMUNITY ENGAGEMENT

Certified Carpentries Instructor 2019–Present

- Co-instructing workshops on R, Python, and Git to train and foster global capacity in essential programming and data science skills for conducting efficient, open, and reproducible research.

Social Science Statistical Consultant 2019–Present

- Promoting statistical programming and latent variable modeling capacity building among social scientists by training and consulting on psychometrics and statistical analysis.

EDUCATION

University of Toronto, PhD in Developmental Psychology and Education	Expected 2025
University of Toronto SCS, Certificate in Data Analytics	2023
University of Toronto, MA in Developmental Psychology and Education	2017–2019
University of Guelph-Humber, BAsC in Psychology	2014–2017

PROFESSIONAL MEMBERSHIPS

National Council on Measurement in Education	2020–Present
American Educational Research Association	2018–Present
International Language Testing Association	2018–Present
Canadian Psychological Association	2016–Present

ADDITIONAL INFORMATION

Awards

Joseph-Armand Bombardier Canada Graduate Scholarship	2020–2023
Ontario Graduate Scholarship	2019
Robert Lado Memorial Award	2019
CPA Certificate of Academic Excellence	2018