Gabriel Wallin, PhD

Email: g.wallin@lancaster.ac.uk
https://www.lancaster.ac.uk/maths/people/gabriel-wallin
Personal website: http://gabrieltwallin.github.io
LinkedIn: linkedin.com/in/gabrielwallin/

School of Mathematical Sciences
Lancaster University, Uk

Academic positions

Lancaster University	Lancaster, UK
Lecturer (Assistant Professor), School of Mathematical Sciences.	2023–Current
The London School of Economics and Political Science	London, UK
Postdoctoral researcher and Visiting Teacher, Department of Statistics.	2021–2024
Université Côte d'Azur & Inria	Nice, France
Postdoctoral Researcher, Department of Mathematics.	2020–2021

Education

Umeå University	Umeå, Sweden
P.hD. in Statistics. Thesis: Extensions of the kernel method of test score equating.	2015–2020
The London School of Economics and Political Science	London, UK
Visiting Research Student in Statistics.	2019
Umeå University	Umeå, Sweden
M.Sc. in Statistics.	2014–2015
Umeå University	Umeå, Sweden
B.Sc. in Statistics	2011–2014

Research interests

- **Latent Variable Modeling**
  Item response theory, exploratory factor analysis, latent class analysis.
- **Statistical machine learning algorithms in psychometrics**
  Proximal algorithms, gradient-based algorithms, statistical learning with sparsity.
- **Assessment development and analysis**
  Test score equating, differential item functioning, outlier detection, causal modeling in education.

Publications in peer-reviewed journals

1. **Wallin, G**. & Wiberg, M. (2024). Smoothing of bivariate test score distributions - Model selection targeting test score equating. Accepted for publication in Journal of Educational and Behavioral Statistics.

2. **Wallin, G**., Chen, Y., Moustaki, I. (2024). DIF Analysis with Unknown Groups and Anchor Items. *Psychometrika*, 89(1), 267-295.

3. **Wallin, G**. & Wiberg, M. (2023). Model Misspecification and Robustness of Observed-Score Test Equating Using Propensity Scores. *Journal of Educational and Behavioral Statistics*, 48(5), 603-635.

4. Liu, X., **Wallin, G**., Chen, Y., Moustaki, I. (2023). Rotation to Sparse Loadings using L^p Losses and Related Inference Problems. *Psychometrika*, 88(2), 527-553.

5. **Wallin, G**. & Wiberg, M. (2021). How Important is the Choice of Bandwidth in Kernel Equating? *Applied Psychological Measurement,* 45, 518-535.

6. Altintaş, Ö. & **Wallin, G**. (2021). Equality of Admission Tests Using Kernel Equating Under the Non-Equivalent Groups With Covariates Design. (2021). *International Journal of Assessment Tools in Education,* 8, 729-743.

7. **Wallin, G**. & Wiberg, M. (2019). Kernel Equating Using Propensity Scores for Nonequivalent Groups. *Journal of Educational and Behavioral Statistics,* 44, 390-414.

Peer-reviewed book chapters

1. González, J. & **Wallin, G**. (2021). An Illustration on the Quantile-Based Calculation of the Standard Error of Equating in Kernel Equating. In Wiberg, M., Molenaar, D., González, J., Böckenholt, U. & Kim, J-S. (Eds.) (2021). *Quantitative Psychology: The 85th Annual Meeting of the Psychometric Society, virtual, 2021.* New York: Springer.

2. **Wallin, G**. & Wiberg, M. (2021). Equating Nonequivalent Groups using Propensity Scores – Model Misspecification and Sensitivity Analysis. In Wiberg, M., Molenaar, D., González, J., Böckenholt, U. & Kim, J-S. (Eds.) (2021). *Quantitative Psychology: The 85th Annual Meeting of the Psychometric Society, virtual, 2021.* New York: Springer.

3. **Wallin, G** (2020). Extensions of the Kernel Method of Test Score Equating. Statistical Studies, 55. *PhD thesis.* URL: https://umu.diva-portal.org/smash/get/diva2:1378833/FULLTEXT01.pdf.

4. **Wallin, G**. & Wiberg, M. (2020). Model Selection for Presmoothing of Bivariate Score Distributions in Kernel Equating. In Wiberg, M., Molenaar, D., González, J., Böckenholt, U. & Kim, J-S. (Eds.) (2020). *Quantitative Psychology: The 84th Annual Meeting of the Psychometric Society, Santiago, Chile, 2019.* New York: Springer.

5. **Wallin, G**., Häggström, J. & Wiberg, M. (2018). How to select the bandwidth in kernel equating - An evaluation of five different methods. In Wiberg, M., Culpepper, S., Janssen, R., González, J., & Molenaar, D. (Eds.) (2018). *Quantitative Psychology: The 82nd Annual Meeting of the Psychometric Society, Zurich, Switzerland, 2017.* New York: Springer.

6. **Wallin, G**,. & Wiberg, M. (2017). Non-equivalent groups with covariates design using propensity scores for kernel equating. In L. A. van der Ark, M. Wiberg, S. A. Culpepper, J. A. Douglas, & W.-C Wang (Eds.) (2017), *Quantitative psychology – 81st annual meeting of the psychometric society, Asheville, North Carolina, 2016.* New York: Springer.

Book Reviews

1. **Wallin, G**. (2024). *Review of* An Introduction to R and Python for Data Analysis: A Side-By-Side Approach (by Taylor R. Brown). The American Statistician.

Grants and Scholarships

- Research Award. Umeå School of Business, Economics and Statistics. 10,000 SEK   2022
- International Postdoc. Swedish Research Council. 3,150,000 SEK   2021
- Research Scholarship. Faculty of Social Science, Umeå University. 40,000 SEK   2019
- Research Scholarship. Kempe Foundation. 25,000 SEK   2018

- Research Scholarship. Umeå School of Business, Economics and Statistics. 40,000 SEK — 2018
- Travel Grant. Wallenberg Foundation. 4,200 SEK — 2018
- Travel Grant. Kempe Foundation. 5,000 SEK — 2017
- Research Scholarship. The Student union at Umeå University. 8,500 SEK — 2017
- Travel Grant. Wallenberg Foundation. 8,000 SEK — 2017
- Travel Grant. Faculty of Social Sciences at Umeå University. 8,000 SEK — 2016
- Research Scholarship. The Student union at Umeå University. 10,000 SEK — 2016

PROFESSIONAL ACTIVITIES

- **Consulting Editor** — 2024-
  British Journal of Mathematical and Statistical Psychology.
- **Website committee member** — 2023-
  Psychometric Society.
- **Committee member** — 2024-
  Young Statisticians, Royal Statistical Society.
- **Executive Committee member** — 2024-
  STOR-i Centre for Doctoral Training, Lancaster University.
- **Responsible for the National Associates Scheme** — 2024-
  STOR-i, Lancaster University.
- **Seminar Organiser** — 2024-
  STOR-i, Lancaster University.
- **Department lead: North West Social Science Doctoral Training Partnership** — 2024-
  Lancaster University.
- **Journal Reviewer**
  Annals of Applied Statistics
  The American Statistician
  Psychometrika
  Computational Statistics and Data Analysis
  British Journal of Mathematical and Statistical Psychology
  Applied Psychological Measurement
  Behavior Research Methods
  TEST
  Educational and Psychological Measurement
  Discover Education
- **Program Committee Member** — 2024
  International Meeting of the Psychometric Society (IMPS). Prague, Czech Republic.
- **Student Mentor** — 2024
  International Meeting of the Psychometric Society (IMPS). Prague, Czech Republic.
- **Reviewer** — 2023
  National Council on Measurement in Education, Annual Meeting. Chicago, United States.
- **Local Organizing Committee Member** — 2022
  Institute of Mathematical Statistics (IMS), Annual Meeting. London, UK.
- **Reviewer for PhD travel award** — 2022
  International Meeting of the Psychometric Society
- **Member of the jury for best poster presentation** — 2022
  International Meeting of the Psychometric Society

- **Conference Chair**   2020–2023
  International Meeting of the Psychometric Society
  National Council on Measurement in Education
- **Board Member**   2018–2020
  Umeå School of Business, Economics and Statistics
  The Graduate Student Association at the Faculty of Social Sciences at Umeå University
- **Committee member**   2018–2019
  The Graduate Student Committee of the Psychometric Society

Awards and nominations

- **Recipient of the Umeå School of Business, Economics and Statistics Research Award**   2022
  Umeå University
- **Recipient of the LSE Class Teacher Award**   2022
  London School of Economics and Political Science
- **Pedagogical Prize Nomination**   2017
  Umeå School of Business, Economics and Statistics

Conference Talks and Invited Presentations

International Meeting of the Psychometric Society   Prague, Czech Republic
Contributed talk: A Change-Point IRT Model with Application to Speededness Detection.   2024

Data Science Seminar Series   Lancaster University, UK
Invited talk: Rotation to Sparse Loadings using Lp Losses and Related Inference Problems.   2024

Statistics Seminar Series   Lancaster University, UK
Invited talk: DIF Analysis with Unknown Groups and Anchor Items.   2023

International Meeting of the Psychometric Society   Maryland, USA
Contributed talk: DIF Analysis with Unknown Groups and Anchor Items.   2023

European Congress of Methodology
Contributed talk: Local Equating of Test Scores using Propensity Scores: A New Method for Non-Equivalent Test Groups With

Nordstat conference   Gothenburg, Sweden
Contributed talk: Rotation to Sparse Loadings using Lp Losses and Related Inference Problems.   2023

Annual Meeting of the National Council on Measurement in Education   Chicago, USA
Contributed talk: A General Item Response Theory Framework for Latent DIF Detection.   2023

Social Statistics Research Seminar   London, LSE
Invited talk: Fairness and Interpretability in Educational Testing and Psychological Surveys.   2022

Computational Psychometrics Research Seminar   Prague, Czech Republic
Invited talk: A Flexible IRT Framework For Latent DIF Detection.   2022

International Meeting of the Psychometric Society   Bologna, Italy
Contributed talk: On Multivariate Outlier Detection.   2022

Cramér Society Research Seminar   Sweden (Virtual)
Invited talk: Two-way outlier detection for item response data.   2022

Social Statistics Research Seminar London, LSE
Invited talk: Test score equating of nonequivalent groups using propensity scores. 2022

International Meeting of the Psychometric Society Virtual
Contributed talk: Simultaneous Clustering of Test-takers and Items for Item Response Data. 2021

Computational Psychometrics Research Seminar Prague, Czech Republic (Virtual)
Invited talk: Equating non-equivalent test groups using covariates. 2021

International Meeting of the Psychometric Society Virtual
Contributed talk: Equating non-equivalent groups using propensity scores. 2020

MAASAI Research Seminar Nice, France
Invited talk: Comparability of nonequivalent test groups in large-scale assessments. 2020

International Meeting of the Psychometric Society Santiago, Chile
Invited talk: Presmoothing method and model selection in kernel equating. 2019

Frontier Research in Educational Measurement Oslo, Norway
Contributed talk: Revisiting the Bahadur representation of sample quantiles for equating. 2018

International Meeting of the Psychometric Society Zürich, Switzerland
Contributed talk: Optimal bandwidth selection in kernel equating for different test types. 2017

Annual Meeting of the National Council on Measurement in Education San Antonio, the US
Contributed talk: Bandwidth selection in kernel equating. 2017

The Winter Conference in Statistics Åre, Sweden
Contributed talk: Selecting bandwidths in kernel equating with different tests and test distributions. 2017

International Meeting of the Psychometric Society Asheville, the US
Contributed talk: Propensity scores in kernel equating for non-equivalent groups. 2016

TEACHING

- **RSS volunteer as Lecturer and Course Responsible** at African Institute for Mathematical Sciences, Cameroon
  2024
  Data mining and Unsupervised Learning.

- **Guest Lecturer** at the London School of Economics 2024
  MSc-level course on quantitative methods at the Dept. of Sociology.

- **Lecturer and Course Responsible** at Lancaster University 2023-
  MSc: Statistical Learning, Unsupervised Learning. BSc: Project Skills.

- **Lecturer and Teaching Assistant** at The London School of Economics 2021-2024
  MY455/MY555: Multivariate Analysis and Measurement (Lecturer)
  ST201: Statistical Models and Data Analysis (TA)
  ST205: Sample Surveys and Experiments (TA)
  ST109: Elementary Statistical Theory I (TA)

- **Lecturer and Course Responsible** at Umeå University 2018
  Sampling: Design and Analysis

- **Lecturer** at Umeå University 2017–2019
  Probability and Statistical Inference

- **Lecturer** at Umeå University 2017–2019

Basic Statistics

- **Teaching Assistant** at Umeå University   2017
  Statistics for Journalists
- **Teaching Assistant** at Umeå University   2014–2017
  Basic Statistics

Supervision

- **Bachelor Thesis Supervisor**   Spring 2018
  Thesis topic: Kernel smoothing techniques with applications to educational testing.
- **Master Thesis Supervisor**   2015 –2020
  Yearly quantitative advisor to business students writing their master's thesis.

Pedagogical Courses

- **Teaching in higher education** at Umeå University
  3 ECTS (2 weeks)
- **Learning in higher education** at Umeå University
  4.5 ECTS (3 weeks)
- **Didactics for university teachers** at Umeå University
  3 ECTS (2 weeks)

REFERENCES

Irini Moustaki London, UK

Professor of Statistics, London School of Economics and Political Science

Yunxiao Chen London, UK

Assistant Professor of Statistics, London School of Economics and Political Science

Marie Wiberg Umeå, Sweden

Professor of Statistics, Umeå University