Department of Statistics and Operations Research
School of Mathematical Sciences
Ruth Heller Tel Aviv University

CURRICULUM VITAE

August 2024

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EDUCATION

1992-1996	B. Sc.	Mathematics McGill University Date of award: 1996
1996-1998	M. Sc.	Biostatistics University of Washington Date of award: 1998
2002-2007	Ph. D.	Statistics Tel-Aviv University Date of award: 2008 Title of Doctoral Dissertation: Statistical issues related to fMRI experiments Name of Supervisor: Professor Yoav Benjamini

ACADEMIC AND PROFESSIONAL EXPERIENCE

1997-1998	Research Assistant of Professor Peter Guttorp and Professor Paul Sampson, National Research Center for Statistics and the Environment, University of Washington
1998-1999	Statistical consultant with the Statistics Consulting Laboratory, Industrial engineering and management faculty, Technion
1999-2000	Research Assistant of Professor Nahum Kiryati, Electrical Engineering-Systems, Tel-Aviv University
2000-2002	Software Engineer, DSP group, Comverse
2002-2007	Teaching Assistant, Department of Statistics and Operations Research, Tel-Aviv University
2007-2009	Mark O. Winkelman Distinguished Scholar in Residence Visiting Lecturer of Statistics, Department of Statistics, University of Pennsylvania
2009-2011	Senior Lecturer, Industrial engineering and management faculty, Technion

2011-2015	Senior Lecturer, Department of Statistics and Operations Research, Tel-Aviv University
2015-2016	Senior Visiting Fellow, National Cancer Institute Division of Cancer Epidemiology & Genetics, Biostatistics Branch, MD, USA
2015-2021	Associate Professor, Department of Statistics and Operations Research, Tel-Aviv University
2021-present	Professor, Department of Statistics and Operations Research, Tel-Aviv University

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Council member of the Israel Statistical Association 2013-2015

EDITORIAL POSITIONS AND REFEREEING

Associate Editor, Journal of the Royal Statistical Society, Series B, 2024 -

Associate Editor, Journal of the American Statistical Association, 2023 - 2024.

Associate Editor, Annals of Statistics, 2016 - 2021.

Referee for Annals of Applied Statistics; Annals of Statistics; Biometrika; Biostatistics; Briefings in Bioinformatics; Journal of the American Statistical Association; Journal of machine learning research; Journal of multivariate analysis; Journal of the Royal Statistical Society Series B; Journal of Statistical Planning and Inference; Neuroimage; Technometrics; Statistical Science

TEL-AVIV UNIVERSITY ADMINISTRATIVE ROLES

Responsible for exemptions from statistics courses 2016-2022
Statistics councilor for undergraduate students 2022-present.

LIST OF PUBLICATIONS

REFEREED PUBLISHED RESEARCH PAPERS

1. R. Grossmann (my maiden name), N. Kiryati, R. Kimmel
   Computational surface flattening: a voxel-based approach.
   IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) 24 (2002), 433-441.

2. F. Abramovich, R. Heller
   Local functional hypothesis testing.
   Mathematical Methods of Statistics 14 (2005), 253-266.

3. R. Heller, D. Stanley, D. Yekutieli, N. Rubin, Y. Benjamini
   Cluster-based analysis of fMRI data.
   NeuroImage 33 (2006), 599-608.

4. Y. Golland, B. Shlomo, H. Gelbard, Y. Benjamini, R. Heller, Y. Nir, U. Hasson, R. Malach
   Extrinsic and intrinsic systems in the posterior cortex of the human brain. Cerebral Cortex 17 (2007), 766-777.

5. R. Heller, Y. Golland, R. Malach, Y. Benjamini
   Conjunction group analysis: an alternative to mixed/random effect analysis
   NeuroImage 37 (2007), 1178-1185.

6. Y. Benjamini, R. Heller
   False discovery rates for spatial signals
   Journal of the American Statistical Association 102 (2007), 1272-1281.

7. Y. Benjamini, R. Heller
   Screening for partial conjunction hypotheses
   Biometrics 64 (2008), 1215-1222.

8. R. Heller, E. Manduchi, D. Small
   Matching methods for observational microarray studies
   Bioinformatics 25 (2009), 904-909.

9. R. Heller, E. Manduchi, G. Grant, W. Ewens
   A flexible two-stage procedure for identifying gene sets that are differentially expressed
   Bioinformatics 25 (2009), 1019-1025.

10. R. Heller, P. Rosenbaum, D. Small
    Split samples and design sensitivity in observational studies
    Journal of the American Statistical Association 104 (2009), 1090-1101.

11. Y. Benjamini, R. Heller, D. Yekutieli
    Selective inference in complex research
    Philosophical Transactions of the Royal Society A 367 (2009).

12. R. Heller, S. Jensen, P. Rosenbaum, D. Small
Sensitivity analysis for the cross-match test with applications in genomics
Journal of the American Statistical Association 105 (2010), 1005-1013.

13. R. Heller, P. Rosenbaum, D. Small
Using the cross-match test to appraise covariate balance in matched pairs
The American Statistician 64 (2010), 299-309.

14. R. Heller, M. Gorfine, Y. Heller
A class of multivariate distribution-free tests of independence based on graphs
Journal of Statistical Planning and Inference 142 (2012), 3097–3106.

15. R. Heller, Y. Heller, M. Gorfine
A consistent multivariate test of association based on ranks of distances
Biometrika 100 (2013), 503-510.

16. M. Bogomolov, R. Heller
Discovering findings that replicate from a primary study of high dimension to a follow-up study
Journal of the American Statistical Association 108 (2013), 1480-1492.

17. R. Heller, D. Yekutieli
Replicability analysis for genome-wide association studies
Annals of Applied Statistics 8 (2014), 481-498.

18. R. Heller, S. Yaacoby, D. Yekutieli
repfdr: A tool for replicability analysis for genome-wide association studies
Bioinformatics 30 (2014), 2971-2972.

19. R. Heller, M. Bogomolov, Y. Benjamini
Deciding whether follow-up studies have replicated findings in a preliminary large-scale omics study
Proceedings of the National Academy of Sciences of the United States of America (PNAS) 111 (2014), 16262-16267.

20. M. Gorfine, B. Goldstein, A. Fishman, R. Heller, Y. Heller, A. Lamm
Function of cancer associated genes revealed by modern univariate and multivariate association tests
PLOS ONE 10 /5 (2015), doi: 10.1371/journal.pone.0126544.

21. C. Angelini, R. Heller, R. Volkinshtein, D. Yekutieli
Is this the right normalization? A diagnostic tool for ChIP seq normalization.
BMC Bioinformatics 16/150 (2015), doi:10.1186/s12859-015-0579-z.

22. R. Heller, Y. Heller, S. Kaufman, B. Brill, M. Gorfine
Consistent distribution-free K-sample and independence tests for univariate random variables.
Journal of Machine Learning Research, 17 (2016), 1-54.

23. R. Heller and Y. Heller
Multivariate tests of association based on univariate tests.
Neural Information Processing Systems (NIPS) Proceedings (2016).

24. N. Karp, R. Heller, S. Yaacoby, J. White, and Y. Benjamini.
Improving the identification of phenotypic abnormalities and sexual dimorphism in mice when studying rare event categorical characteristics.
Genetics (2016), DOI: 10.1534/genetics.116.195388

25. T. Sofer, R. Heller, M. Bogomolov, C. Avery, M. Graff, K. North, A. Reiner, T. Thornton, K. Rice, Y. Benjamini, C. Lauriee, and K. Kerr.
A Powerful statistical framework for generalization testing in GWAS, with application to the HCHS/SOL.
Genetic Epidemiology (2017), DOI: 10.1002/gepi.22029.

26. R. Eilenberg and R. Heller
On the use of balancing scores and matching in testing for exposure effect in case-control studies.
Statistics and Its Interface, Vol. 11, No. 1, pp.51-60, 2017.

27. L. Jiang, A. Amir, J. Morton, R. Heller, E. Arias-Castro, R. Knight
Discrete False-Discovery Rate Improves Identification of Differentially Abundant Microbes.
mSystems (2017), https://doi.org/10.1128/ mSystems.00092-17.

28. N. Karp, J. Mason, A. Beaudet, Y. Benjamini, L. Bower, R. Braun, S. Brown, E. Chesler, M. Dickinson, A. Flenniken, H. Fuchs, M. Hrabe de Angelis, X. Gao, S. Guo, S. Greenaway, R. Heller, Y. Herault, M. Justice, N. Kurbatova, C. Lelliott, K. Lloyd, A. Mallon, J. Mank, H. Masuya, C. McKerlie, T. Meehan, R. Mott, S. Murray, H. Parkinson, R. Ramirez-Solis, L. Santos, J. Seavitt, D. Smedley, T. Sorg, A. Speak, K. Steel, K. Svenson, S. Wakana, D. West, S. Wells, H. Westerberg, S. Yaacoby, and J. White
Prevalence of sexual dimorphism in mammalian phenotypic traits.
Nature Communications 8 (2017), article number 15475.

29. Sun L., Subar A.F., Bosire C., Dawsey S.M., Kahle L.L., Zimmerman T.P., Abnet C.C., Heller R., Graubard B.I., Cook M.B., and Petrick J.L.
Dietary Flavonoid Intake Reduces the Risk of Head and Neck but Not Esophageal or Gastric Cancer in US Men and Women.(2017)
The Journal of Nutrition 147 (9), 1729—1738.

30. R. Heller, N. Chatterjee, A. Krieger, and J. Shi

Post-selection inference following aggregate level hypothesis testing in large scale genomic data.
Journal of the American Statistical Association 113 (524), 2018.

31. J. Sampson, S. Boca, S. Moore, and R. Heller
FWER and FDR control when testing multiple mediators.
Bioinformatics 34 (14), 2018.

32. M. Bogomolov and R. Heller
Assessing replicability of findings across two studies of multiple features.
Biometrika 105 (3), 2018.

33. B. Brill, Y. Heller, and R. Heller
Nonparametric independence tests and K-sample tests for large sample sizes, using package HHG.
R Journal, 2018.

34. B. Karmakar, R. Heller, and D. Small
False discovery rate control for effect modification in observational studies.
Electronic Journal of Statistics 12 (2), 2018.

35. Kafkafi, N; Agassi, J; Chesler, EJ; Crabbe, JC; Crusio, WE; Eilam, D; Gerlai, R; Goiani, I; Gomez-Marin, A; Heller, R; Iraqi, F; Jaljuli, I; Karp, NA; Morgan, H; Nicholson, G; Pfaff, DW; Richter, SH; Stark, PB; Stiedl, O; Stodden, V; Tarantino, LM; Tucci, V; Valdar, W; Williams, RW; Wurbel, H; Benjamini, Y
Reproducibility and replicability of rodent phenotyping in preclinical studies
Neuroscience and behavioral reviews 87, 2018.

36. R. Heller, A. Meir, and N. Chatterjee
Post-selection estimation and testing following aggregated association tests.
Journal of the Royal Statistical Society, Series B, 81 (3), 2019.
Impact factor: 4.488; quartile: Q1. Citations: 14.
37. R. Heller and S. Rosset
Optimal control of false discovery criteria in the two-group model.
Journal of the Royal Statistical Society, Series B, 83 (1), 2021.

38. A. Heifetz, R. Heller, and R. Ostreiher
Do Arabian babblers play mixed strategies in a ``volunteer's dilemma"?
Journal of Behavioral and Experimental Economics, 91, 2021.

39. S. Rosset, R. Heller, A. Painsky, and E. Aharoni
Optimal and maximin procedures for multiple testing problems
Journal of the Royal Statistical Society, Series B, accepted, 2022.
40. M. Haroush, T. Frostig, R. Heller, D. Soudry
A statistical framework for efficient out of distribution detection in

deep neural networks.
The tenth International Conference on Learning Representations (ICLR), accepted, 2022.

41. B. Brill, A. Amir, and R. Heller
Testing for differential abundance in compositional counts data, with application to microbiome studies.
The Annals of Applied Statistics (AOAS), 16 (4), 2022.

42. I. Jaljuli, Y. Benjamini, L. Shenhav, O. Panagiotou, and R. Heller
Quantifying replicability and consistency in systematic reviews.
Statistics in biopharmaceutical research, 15 (2), 2022.

43. R. Heller, A. Krieger, and S. Rosset
Optimal multiple testing and design in clinical trials.
Biometrics, 2023.

44. M. Bogomolov and R. Heller
Replicability across multiple studies.
Statistical Science, 2023.

45. R. Heller and A. Solari
Simultaneous direction inference
Journal of the Royal Statistical Society Series B: Statistical Methodology, 86(3), 2024.

REFEREED DISCUSSIONS

1. S. Sarkar, R. Heller
Comments on: Control of the False Discovery Rate under Dependence using the Bootstrap and Subsampling
Test 17 (3), 450-455, 2008.

2. R. Heller
Comment: Correlated z-values and the accuracy of large-scale statistical estimates
Journal of the American Statistical Association 105, 1057–1059, 2010.

3. R. Heller
Discussion of ``Multiple testing for Exploratory Research'' by J.J. Goeman and A. Solari
Statistical Science 26, 598–600, 2012.

4. R. Heller
Comments on: Hierarchical inference for genome-wide association studies: a view on methodology and software
Computational Statistics 35 (1), 2020.

5. O.A. Panagiotou, I. Jaljuli, and R. Heller

Replicability of Treatment Effect in Study of Blood Pressure Lowering with Dementia.
JAMA, 2020; 324(14): 1465-1466. Doi:10.1001/jama.2020.14871

6. O.A. Panagiotou and R. Heller
Inferential Challenges for Real-world Evidence in the Era of Routinely Collected Health Data
Many Researchers, Many More Hypotheses, a Single Database
JAMA Oncol. 2021. doi:10.1001/jamaoncol.2021.3537

7. Y. Benjamini, R. Heller, A. Krieger, and S. Rosset
Discussion on ``Optimal test procedures for multiple hypotheses controlling the familywise expected loss" by Willi Maurer, Frank Bretz, and Xiaolei Xun
Biometrics, 2023.

RESEARCH GRANTS

2009-2011	U.S.-Israel Binational Science Foundation (BSF) grant No. 2008049 for 60000$, Principal Investigator (PI).
2010-2013	Israel Science Foundation (ISF) grant no. 2012896 for 327000NIS, Principal Investigator (PI).
2010-2011	The Allon Fellowship, Technion.
2010-2011	Landau Fellowship of the Taub Foundation, Technion.
2014-2015	TAU Encouragement Grant for 19000NIS.
2015-2016	TAU Encouragement Grant for 9500NIS.
2016-2020	Israel Science Foundation (ISF) grant no. 1049/16 for 640000NIS, Principal Investigator (with Daniel Yekutieli).
2017-2019	TAU-University of Toronto Joint Research Projects in Big Data in Health and Biomedical Research, for 12500$. Principal Investigator (with Shelley Bull).
2020-2024	Israel Science Foundation (ISF) grant no. 2180/20 for 992000NIS, Principal Investigator (with Saharon Rosset).
2021-2025	Malag competitive grant in data science (DS), co-PI with six others, for 4,000,000NIS.
2024-2028	Israel Science Foundation (ISF) grant no. 406/24, Principal Investigator

MASTERS STUDENTS SUPERVISED

2010-2012 Hadas Gur, "FDR Controlling Procedures for Discrete Data".

2011-2013 Meron Avidan, "Integrated two-stage procedures for multiple comparisons".

2011-2014 Rita Volkinshtein, "Normalization in ChIP-seq experiments".

2013-2015 Amos Rosenbaum, "A study of parametric and nonparametric tests for the analysis of variance in the 2-way layout".

2014-2015 Roni Eilenberg, "On the use of balancing scores in testing for exposure effects in case-referent studies".

2012-2016 Liat Shenhav, "Replicability and meta-analysis in systematic reviews for medical research".

2014-2016 Barak Brill, "Scalable non-parametric tests of independence".

2012-2017 Shay Yaacoby, "Statistical Tools for Replicable and Reproducible Research".

2016-2018 Nadav Greifman, "Rare variant testing".

2019-2021 Alice Fridberg "Assessing the causal effect of a treatment in a design with multiple controls".

2019 - 2021 Ron Itzikovich "Distribution-free multivariate tests of independence between two random vectors"

2021- 2023 Oded Ohana ``Testing grouped hypotheses with optimal control of false discovery criteria”

2021- Elinatan Bodinger

PHD STUDENTS SUPERVISED

2016-2022 Barak Brill, "Statistical challenges in microbiome research and analysis of discrete compositional data".

2018- 2024 Tzviel Frostig, "Topics in selective inference and hierarchical inference".

2022- Rajesh Karmakar, "Approximately optimal computationally efficient methods in multiple comparisons".