Elena Stanghellini

CURRICULUM VITAE ET STUDIORUM

October 31st, 2024

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A.D. 1308 unipg UNIVERSITÀ DEGLI STUDI DI PERUGIA

1. Education

1995: Ph.D. in Applied Statistics at the Università degli Studi di Firenze (awarded ex-equo 'Best Italian Doctoral Thesis in Statistics of the year' by the Italian Statistical Society).

1991: M.Sc. Degree with honors in Economics at the Università degli Studi di Firenze.

1987: B.Sc. Degree with honors in Statistics at the Università degli Studi di Firenze.

2. Academic career

2005 (1 December to date): Full Professor in Statistics at the Dipartimento di Economia Finanza e Statistica, Università degli Studi di Perugia.

2001 (1 November) – 2005 (30 November): Associate Professor in Statistics at the Dipartimento di Economia Finanza e Statistica, Università degli Studi di Perugia.

1997 (8 April) – 2001 (31 October): Lecturer at the Dipartimento di Scienze Statistiche, Università degli Studi di Perugia.

1996 (1 September) - 1997 (31 March): Research Fellow at the Dipartimento di Statistica "G. Parenti", Università degli Studi di Firenze.

1994 (1 Nov) - 1996 (30 June): Research Fellow at the Department of Statistics, Open University, Milton Keynes, (U.K.).

3. Research interests

Theoretical research on Graphical Markov Models, Path Analysis, Bayesian Networks, Structural Equation Models, Causal Inference, Mediation Analysis, Latent variable models.

Applied research in Epidemiology, Microeconomics and Medicine.

4. International Fellowships and Research Grants

2021 - 2024: *Affiliated Professor* at Umeå University, Sweden.

2023 (Oct-Nov): Visiting Professor at the London School of Economics and Political Science (U.K.).

2021 (Nov-Dec): Awarded a Research Grant from the Deutsche Academic Austauschdients for a research visit at the RWTH Aachen University (DE) to develop a project on mediation analysis.

2011 – 2014: Member of the Umeå SIMSAM Lab network (simsam.org.umu.se): A register-based research program connecting childhood with lifelong health and welfare.

2011 – 2014: American Institute of Mathematics (AIM, Palo Alto, www.aimath.org, Square grant) to develop a research on "Identification of Graphical Models with latent variables".

2010 – 2012: Member of the Sustainable Investment Research Program (SIRP), granted by the Swedish Foundation MISTRA (www.sirp.se).

2007 (May - Oct): Awarded a *Visiting Professorship* at the Center of Research in Statistical Methodology (CRISM) of the University of Warwick (U.K.).

1998 (October): *Jemolo Fellow* at Nuffield College, Oxford University (U.K.).

5. Teaching activities

Introductory course on Statistics (undergraduate level); Linear regression and Multivariate Statistics (undergraduate level); Advanced Multivariate Statistics (master level); Statistical methods for Credit Scoring (master level); Graphical Markov Models (doctoral level).

6. Other information

Since 2010 Elected Member of the International Statistical Institute.

Component of the Scientific Committee of the International Conference on Uncertainty and Artificial Intelligence, UAI2022 – UAI2025.

Supervisor or co-supervisor of 8 Ph.D. students (Francesco Claudio Stingo, Eduwin Pakpahan, Minna Genbåck, Marco Doretti, Laura Pazzagli, Loris Edoardo Rossi, Carmine da Fermo, Gennaro de Novellis).

2023-on going: Component of the National Research Program PRIN2022 "Complex graphical models for biological network science" (principal investigator prof. F.C. Stingo).

2021 – 2024: Member of the Program Committee of International Conference on Uncertainty and Artificial Intelligence.

From April 2020 to October 2020: Member of the Advisory Board of the Italian Bureau of Statistics (ISTAT) for the design and implementation of sample surveys to measure and monitor epidemiological parameters of COVID-19 pandemic.

From May 2020 to October 2020: Member of the research group "Inpresa" for the analysis and forecasting of COVID19 pandemic, granted by the Lombardia region.

2013 – 2019: Deputy Rector of the University of Perugia.

From 2012 to 2016: Director of the Ph.D. program in "Mathematical and Statistical Methods for the Economic and Social Sciences".

2010 to date: Elected Member of the International Statistical Institute (http://www.isi-web.org/).

2010 to date: Member of the Editorial Board of Statistical Papers.

7. Languages

Italian: mother language.

English: fluent (C2).

French: very good comprehension (B2), good speaking (B1) and writing (B1).

8. Publications

Papers on peer-reviewed scientific international journals

1. STANGHELLINI E., DORETTI M., TEZUKA T. (2024). A note on "Simple graphical rules to assess selection bias in general-population and selected-sample treatment effects" by M. B. Mathur and I. Shpitser. American Journal of Epidemiology. Forthcoming. https://doi.org/10.1093/aje/kwae337
2. GOURGOURA K., RIVADENEIRA P., STANGHELLINI E., CARONI C., BARTOLUCCI F., …, PUCCI G., VAUDO G. (2024). Modelling the long term impact of COVID-19 using Graphical Chain Model. BMC Infectious Diseases. https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-024-09777-0
3. DE NOVELLIS G., MUSILE TANZI P., STANGHELLINI E. (2024). Covenant-lite agreement and credit risk: a key relationsjip on the leveraged loan market. Research In International Business and Finance, ISSN 0275-5319, E-ISSN 1878-3384, Vol. 70, no Part B, article id 102377. 10.1016/j.ribaf.2024.102377
4. DA FERMO C., MUSILE TANZI P., NICOLOSI M., STANGHELLINI E. (2024). "On the relationship between Financial and Sustainable variables: Insights from Graphical Gaussian Model". Journal of Financial Management, Markets and Institutions. http://dx.doi.org/10.2139/ssrn.4312617
5. DORETTI M., GENBÄCK, M., STANGHELLINI E. (2024). "Mediation analysis with case-control sampling: Identification and estimation in the presence of a binary mediator". Biometrical Journal. https://doi.org/10.1002/bimj.202300089.
6. DE NOVELLIS G., MUSILE TANZI P., RANALLI G., STANGHELLINI E. (2024). "Leveraged finance exposure in the banking system: Systemic risk and interconnectedness". Journal of International Financial Markets, Institutions and Money, Vol. 90. https://doi.org/10.1016/j.intfin.2023.101890.
7. LANZILAO L., MARINIELLO A., POLENZANI B., ALDINUCCI A., NAZERIAN P., PROTA A., GRIFONI S., TONIETTI B., NERI C., TURCO L., FANELLI A., AMEDEI A., STANGHELLINI E. (2023). "A Computational Approach in the Diagnostic Process of COVID-19: The Missing Link between the Laboratory and Emergency Department". Frontiers in Bioscience (Landmark Ed). https://pubmed.ncbi.nlm.nih.gov/36866553/
8. GUERRANTI R., FASANO T., …, LANZILAO L., STANGHELLINI E., GIAVARINA D., RIVA G., PADOAN A. (2022) "Big data e intelligenza artificiale in medicina di laboratorio - Artificial intelligence and big data in laboratory medicine" Biochimica Clinica; 47(1) 074-08. (On Line) doi: 10.19186/BC_2022.080
9. STANGHELLINI E., KATERI M. (2022). "Exact Parametric Mediation for Ordinal Outcome and Binary Mediator". Epidemiology, Vol. 33(6), pp. 840-842 https://pubmed.ncbi.nlm.nih.gov/36220580/
10. DORETTI M., RAGGI M., STANGHELLINI E. (2022) "Exact parametric causal mediation with a binary outcome with a binary mediator". *Statistical Methods and its Application*, Vol. 31, pp. 87–108, https://link.springer.com/article/10.1007/s10260-021-00562-w. Published online first in 2021.

11. RAGGI M., STANGHELLINI E., DORETTI M. (2021). "Path Analysis for Binary Random Variables". *Sociological Methods and Research*. Published online first. https://doi.org/10.1177/00491241211031260

12. STANGHELLINI E., DORETTI M. (2019). "On marginal and conditional parameters in logistic regression models". *Biometrika*, Vol. 106(3), pp. 732-739, https://doi.org/10.1093/biomet/asz019.

13. DORETTI M., GENELETTI S., STANGHELLINI E. (2018). "Missing Data: A Unified Taxonomy Guided by Conditional Independence". *International Statistical Review,* Vol. 86, pp. 189-204 http://dx.doi.org/10.1111/insr.12242.

14. GENBÄCK M., NG N., STANGHELLINI E., DE LUNA X. (2018). "Predictors of decline in self-reported health: addressing non-ignorable dropout in longitudinal studies of aging". *European Journal of Ageing*, 11, Vol. 15, pp.211-220, https://doi.org/10.1007/s10433-017-0448-x.

15. MEALLI F., PACINI B., STANGHELLINI E. (2016). "Identification of principal causal effects using secondary outcomes in concentration graphs". *Journal of Educational and Behavioural Statistics*, Vol. 41, pp. 463-480, doi:10.3102/1076998616646199.

16. DORETTI M., GENELETTI S., STANGHELLINI E. (2016). "Tackling non-ignorable dropout in the presence of time varying confounding". *Journal of the Royal Statistical Society, Series C.*, Vol. 65, pp. 775-795, doi:10.1111/rssc.12154.

17. PIERRI F., STANGHELLINI E., BISTONI N. (2016). "Risk analysis and retrospective unbalanced data". *REVSTAT*, 14, Vol. 2, pp. 157-169.

18. ALLMAN E.S., RHODES J. A., STANGHELLINI E., VALTORTA M. (2014). "Parameter identifiability of Discrete Bayesian Networks with Hidden Variables*". Journal of Causal Inference*, doi: 10.1515/jci-2014-0021. Electronic Journal.

19. STANGHELLINI E., PAKPAHAN E. (2014). "Identification of Causal Effects in Linear Models: beyond Instrumental Variables". *TEST*, 24, Vol. 3, pp.489-509, doi: 10.1007/s11749-014-0421-3.

20. GENBÄCK, M., STANGHELLINI E., DE LUNA X. (2014). "Uncertainty Intervals for regression parameters with non-ignorable missingness in the outcome. *Statistical Papers*, 56, Vol. 3, pp. 829-847, doi: 10.1007/s00362-014-0610-x.

21. NICOLOSI M., GRASSI S., STANGHELLINI E. (2014). "Item Response Models to Measure Corporate Social Responsibility". *Applied Financial Economics*, Vol. 24, Vol. 22, pp.1449-1464, doi: 10.1080/09603107.2014.925070.

22. PIERRI F., BURCHI A., STANGHELLINI E. (2013). "La capacità predittiva degli indicatori di bilancio: un metodo per le PMI". *Piccola Impresa/Small Business*, Vol 1, pp. 85-108 (in Italian).

23. STANGHELLINI E., VANTAGGI B. (2013). "On the identification of discrete concentration graph models with one hidden binary variable ". *Bernoulli*, Vol. 19, Number 5A, pp. 1920-1937, doi: 10.3150/12-BEJ435.

24. STINGO F.C., STANGHELLINI E., CAPOBIANCO R. (2011). "On the estimation of a binary response model in a selected population". *Journal of Statistical Planning and Inference*, 141, pp. 3293-3303, doi:10.1016/j.jspi.2011.04.014.

25. HUTTON J.L., STANGHELLINI E. (2011). "Modelling bounded health scores with censored skew-normal distributions". *Statistics in Medicine*, Vol. 30, pp. 368–376, doi: 10.1002/sim.4104.

26. FORCINA A., GIOVAGNOLI A., STANGHELLINI E. (2011). "Non-compliance in surgical patients with herniated lumbar discs: an application of an extended latent class model as a selection model", *Statistical Modelling*, Vol. 11(4), pp. 311-324, doi: 10.1177/1471082X1001100402.

27. FALOCCI N., PANICCIA' R., STANGHELLINI E. (2009). "Regression modelling of the flows in an input-output table with accounting constraints", *Statistical Papers*, Vol. 50, pp. 373-382.

28. GIORGI ROSSI. P., MANTOVANI J., FERRONI J., FORCINA A., STANGHELLINI E., CURTALE F., BORGIA P. (2009). "Bacterial meningitis surveillance in Lazio, Italy: a system integrating laboratory specificity to hospitalization database sensitivity", *BMC Infectious Diseases,* 9.

29. MARCHETTI G.M., STANGHELLINI E. (2008). "A note on distortions induced by truncation, with application to linear regression systems"*, Statistics & Probability Letters*, Vol. 78, pp. 824-829.

30. WERMUTH N., STANGHELLINI E. (2006). Contribution to the Discussion to the paper of Castelo R. e Roverato. A. "A robust procedure for Gaussian graphical model search from microarray data with *p* lager than *n*", *Statistica*, Vol. 66, pp. 366-368.

31. STANGHELLINI E. (2006). "On Statistical Issues raised by the New Capital Accord". *Statistica Applicata*, Vol. 18, 2, pp. 389-405.

32. STANGHELLINI E., WERMUTH N. (2005). "On the identification of path analysis models with one hidden variable", *Biometrika, Vol.* 92, 2, pp. 337-350.

33. STANGHELLINI E., VAN DER HEIJDEN P.G.M. (2004). "A multiple-record systems estimation method that takes observed and unobserved heterogeneity into account". *Biometrics*, Vol. 60, pp. 510-516.

34. STANGHELLINI E. (2004). "Instrumental variables in Gaussian directed acyclic graph models with an unobserved confounder", *Environmetrics,* Vol. 15, pp. 463-469*.*

35. CAPITANIO A., AZZALINI A., STANGHELLINI E. (2003). "Graphical Models for skew-normal variates", *Scandinavian Journal of Statistics*, Vol. 30, pp. 129-144.

36. STANGHELLINI E. (2003). "Monitoring the behaviour of credit card holders with graphical chain models", *Journal of Business, Finance and Accounting,* Vol. 30 (9-10), pp. 1423-1435.

37. GIUDICI P., STANGHELLINI E. (2001). "Bayesian Inference for Graphical Factor Analysis Models", *Psychometrika,* Vol. 66, 4, pp. 577-592.

38. BIGGERI A.,STANGHELLINI E. RUGGERI M. (2001). "Regression analysis of multiple outcomes", *Strumenti e metodi,* Vol*.* 25, pp. 83-89.

39. STANGHELLINI E., McCONWAY K.J., HAND D.J. (1999). "A discrete variable chain graph for applicants for credit", *Journal of the Royal Statistical Society*, series C, Vol. 48, Part 2, pp. 239-251.

40. BIGGERI A., STANGHELLINI E., MERLETTI F., MARCHI M. (1999). "Latent class models for varying catchability and correlation among sources in Capture-Recapture estimation of the size of a human population", *Statistica Applicata*, Vol. 11, 4, pp. 563-576.

41. STANGHELLINI E. (1997). "Identification of a single-factor model using graphical Gaussian rules", *Biometrika*, Vol. 84, pp. 241-244.

42. HAND D.J., McCONWAY K.J., STANGHELLINI E. (1997). "Graphical Models of Applicants for Credit", *Journal of Mathematics Applied in Business and Industry*, Vol. 8, pp. 143-155.

Books or chapters in books

1) FASANO E., GUARDABASCIO B., STANGHELLINI E. (2023) The Role of ESG on Credit Rating in the Banking Sector: A Mediation Analysis to Disentangle the Direc and Indirect Effects, in *ESG Integration and SRI Strategies in the EU*, Palgrave Macmillan. 10.1007/978-3-031-36457-0_8

2) STANGHELLINI E., RANALLI M.G. (2016) "Population size estimation using a categorical latent variable". In Boehning D., Bunge J., van der Heijden P.G. *Capture-Recapture Methods for the Social and Medical Sciences*. Chapman and and Hall. ISBN: 9781498745314.

3) MEALLI F., PACINI B., STANGHELLINI E. (2014). "Identification of principal causal effects using secondary outcomes". In Carpita M., Brentari e. Qannari E. *Advances in Latent Variables. Studies in Theoretical and Applied Statistics*. Springer-Verlag, doi: 10.1007/10104_2014_15.

4) GOTTARD A., STANGHELLINI E., CAPOBIANCO R. (2013). "Semicontinuous regression models with Skew distributions". In: Grigoletto M., Lisi F., Petrone S., *Complex Models and Computational Methods in Statistics*. Springer Verlag, ISBN: 9788847028708, doi: 10.1007/978-88-470-2871-5-12.

5) STANGHELLINI E. (2009). *Introduzione ai metodi statistici per il Credit Scoring*. Springer-Italia. ISBN 9788847010802 (in Italian).

6) GIUDICI P., STANGHELLINI E. (1998). "Graphical Factor Analysis Models: Specification and Model Comparison", in Rizzi A., Vichi M., Bock H.H., (Eds.). *Advances in Data Science and Classification*, Springer, pp. 363-368.

Working papers

1) CALABRESE D., KALANTARI K., SANTUCCI F.M., STANGHELLINI E. (2008). *Environmental Policy and Strategic Communication in Iran*, World Bank Working Paper n. 132, Washington. ISBN 978-0-8213-7421-4, doi: 10.1596/978-0-8213-7421-4.

2) FALOCCI N., PANICCIA' R., STANGHELLINI E. (2005). "Un modello per la stima e la previsione dei flussi regionali delle *presenze turistiche* registrate". IRPET, Working Paper, Firenze.*Working papers.*