

# CURRICULUM OF SCIENTIFIC AND TEACHING ACTIVITY

(updated 24 March 2022)

## Leonardo Grilli

Born in Pistoia, 13th April 1970  
Resident in Buggiano (PT) Via Bellavista 4/C  
Nationality: Italian

Professore Ordinario di Statistica (SECS-S/01) - *Full Professor of Statistics*

Dipartimento di Statistica, Informatica, Applicazioni "G. Parenti" (DiSIA) dell'Università di Firenze -  
*Department of Statistics, Computer Science, Applications "G. Parenti" of the University of Florence*

Email: leonardo.grilli@unifi.it

Web: local.disia.unifi.it/grilli

SCOPUS Author ID:6602373429

ORCID: 0000-0002-3886-7705

WOS Researcher ID: P-2282-2015

### Education

- ✓ Degree in Economics at the University of Florence (20<sup>th</sup> April 1996)
- ✓ PhD in Applied Statistics at the Department of Statistics "G. Parenti" – University of Florence (11<sup>th</sup> February 2000)

### Career

- ✓ Postdoctoral fellow (Assegnista di ricerca) at the Department of Statistics "G. Parenti" – University of Florence (April 2000 to December 2001)
- ✓ Official in the Statistics area – Government of the Tuscany region (January 2002 to October 2002)
- ✓ Assistant Professor (Ricercatore) of Statistics (SECS-S/01) at the University of Florence from November 2002
- ✓ Associate Professor (Professore Associato) of Statistics (SECS-S/01) at the University of Florence from 30<sup>th</sup> December 2010
- ✓ Full Professor (Professore Ordinario) of Statistics (SECS-S/01) at the University of Florence from 1<sup>st</sup> April 2017

### Research interests

My research mainly focuses on random effects models for multilevel analysis, with methodological advances concerning the specification and estimation of models in complex frameworks such as duration data, multivariate qualitative responses, informative sampling designs, and sample selection bias. I also investigated methods for causal inference in the potential outcomes framework, dealing with truncation and partial compliance. In the recent research activity, I considered a variety of statistical methods including IRT models, latent growth

curve models, mixture models, and quantile regression. The methodological work is typically driven by applications on real data in different fields including economics, demography, medicine, and bibliometrics.

### Scientific societies

- ✓ Member of the Italian Statistical Society, since 2004
- ✓ Member of the Executive Committee of the Classification and Data Analysis Group of the Italian Statistical Society

### Current appointments

- ✓ Director of the master-level degree in Statistics and data science (*Laurea Magistrale Statistica e Data Science*), from academic year 2019-20
- ✓ Member of the Comitato della Didattica, corso di Laurea in *Statistica*
- ✓ Member of the Board of the PhD in Development Economics and Local Systems (DELoS) of the University of Florence

### Past appointments

- ✓ Director of the *Laurea Magistrale Statistica, Scienze Attuariali e Finanziarie* (from 2015 to 2019)
- ✓ Member of the Nucleo di Valutazione of the University of Pavia (2019-2013)
- ✓ Member of the Nucleo di Valutazione of the Università Politecnica delle Marche, Ancona (from 25.06.2013 to 31.10.2018)
- ✓ Member of the Scientific Board of the PdD in Applied Statistics 2012 (28<sup>th</sup> cycle) – European University of Rome

### Current lectureships at the University of Florence

- ✓ Course on Descriptive Statistics and Probability (“B000319 Statistica I”, corso di laurea in Statistica), from academic year 2008/09
- ✓ Course on Statistical Modelling (“B029803 Teoria e pratica dei modelli statistici”, corso di laurea magistrale in Statistica e data science, previously “B004630 Modelli statistici (avanzato)”), joint with Carla Rampichini, from academic year 2008/09
- ✓ Lab on statistical modelling with Stata (“B030725 Stata Lab II: models and applications”, corso di laurea in Economics and Development), from academic year 2020/21

### Teaching: a) undergraduate and master level

- ✓ Teaching assistant for some courses of the degree in Statistics at the University of Florence, from academic year 2000/01

- ✓ Principal teacher of several introductory Statistics courses (descriptive statistics and classical inference) at the University of Florence (for the degrees in Statistics, Business Economics, Economics and Engineering of Quality, Political Science), from academic year 2002/03
- ✓ Module on regression analysis of the labour market within the course Labour Economics of the degree in Economics at the University of Florence, academic year 2006/07

[The student ratings of the courses are published on <http://valmon.disia.unifi.it/sisvalidat/unifi>]

### Teaching: b) Phd courses

- ✓ Module “Random effects models for multilevel and longitudinal data” for the PhD in Mathematics, Computer Science and Statistics – University of Florence, January 2022
- ✓ Module “Econometrics I”, Ph.D. in Development Economics and Local Systems (DELoS), cycles 36<sup>th</sup>, November 2020 and 37<sup>th</sup>, November 2021
- ✓ Lessons on multilevel analysis for the PhD in Public policy and administration at the University “L. Bocconi” of Milan, June 2020
- ✓ Lessons on statistical inference for the PhD in Mathematics, Computer Science and Statistics – University of Florence, a.y. 2014/15 and 2015/16 (marginal and conditional likelihood, profile likelihood, EM algorithm)
- ✓ Lessons on multilevel and longitudinal analysis for the PhD in Statistics at the University “L. Bocconi” of Milan, February 2009
- ✓ Lessons on multilevel analysis for the PhD in Applied Statistics at the Department of Statistics, University of Florence (academic year 2003/04 and later)

### Teaching: c) short courses

- ✓ Lessons on multilevel analysis:
  - Module on Multilevel Modelling, RECSM Summer School, Barcelona, every year from 2014
  - School of the Italian Statistical Society (several courses, in particular about 14 hours teaching in the course ‘Theory and practice of random effects models for multilevel and longitudinal data’, editions 2007, 2009, 2011, 2013, 2015, 2017, 2019)
  - University of Konstanz, 6-7 June 2017
  - Società Italiana di Biometria, 26° corso di metodologia statistica per la ricerca biologica di base ed applicata (Parte II), 25-26 October 2015, Gargnano del Garda (BS)
  - Vienna University of Economics and Business, 18-19 December 2014
  - Karolinska Institutet, Stockholm, 4-5 September 2014
  - Introduzione ai modelli multilivello per l’analisi di dati in ambito sociale, sanitario e biologico. Short course at the IX Congresso Nazionale della SOCIETA' ITALIANA DI BIOMETRIA, Bressanone 25-26 June 2013.
  - Ludwig-Maximilians-Universität München, 22-23 April 2013
  - Introduction to multilevel modeling with applications to quality-of-life studies. Short course at the XI ISQOLS Conference, Venice, Università Cà Foscari, 1st November 2012.
  - Universidade de Santiago de Compostela, February-March 2012, March 2018
  - London School of Economics and Political Science, June 2010
  - INVALSI, April 2010
  - Universidad de Castilla-La Mancha, April 2008
  - Department of Econometrics, University of Geneva, April-May 2007

- CLADAG School 'Multivariate statistical methods for the analysis of clustered data', Bologna, February 2007
- Vienna Institute of Demography, December 2006
- University of Economics in Bratislava, April 2006
- Athens University of Economics and Business, September 2005
- Master in Applied Statistics at the University of Sassari (June 2004 and 2005)
- ✓ Lessons on introductory statistics:
  - D20Leader course organized by Fondirigenti, Pratolino, October-December 2019
- ✓ Lessons on causal inference:
  - Ludwig-Maximilians-Universität München, 24 April 2013
  - Seminari sui metodi di valutazione delle politiche - Agenzia Regionale di Sanità (Firenze, 26-27 February 2013)
  - University of Bristol (June 2011)
  - Italian Statistical Society (course in May 2010)
- ✓ Lessons on models for panel data:
  - Spring School on Econometric Analysis (organized by the PhD in Economics at the University of Florence in collaboration with Marie Curie Project EduWEL), March 2011

#### Teaching: d) promoting statistical literacy

- ✓ Lessons about probability and statistics in several secondary schools (some lessons held under the Pianeta Galileo project, editions all editions from 2013)
- ✓ Lessons about teaching statistics for teachers of secondary schools, course organized by the University of Florence (2013, 2015, 2016, 2017, 2019)
- ✓ Lessons "A handful of pitfalls in statistics", University of Málaga, April 2019.
- ✓ Talk "La statistica: uno strumento essenziale per capire la realtà", conference for the Italian day of Statistics (Florence, 24.10.2014)

#### Supervised theses

- ✓ Gerard Pedanou: *Rassegna di modelli di regressione per proporzioni*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie" 3 December 2021.
- ✓ Viviana Carcaiso: *The impact of remote teaching on university students' gained credits: an analysis based on parametric modeling of quantile regression coefficient functions*. Master thesis (laurea magistrale) in "Statistica e data science" 13 July 2021
- ✓ Davide Pasquale Cacoza: *Talento e fortuna: un'analisi di microsimulazione*. Tesi di laurea in Statistica. 13 April 2021.
- ✓ Qianyi Li: *Matching Techniques for Assessing the Effect of Preschool Education on Students' Invalsi Achievement in Italy*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie" 11 February 2021.
- ✓ Noemi Benci: *Bayesian variable selection in a multilevel model with missing data*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie" 11 February 2021.
- ✓ Petracchi *Modelli di transizione per dati di conteggio: analisi del comportamento turistico degli italiani durante la Grande Recessione*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie" 11 February 2021
- ✓ Federico Pirona: *Location-shift model: a solution for dispersion in ordinal data*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie" 9 December 2020.

- ✓ Pietro Pratesi: *Il paradosso di Berkson: importanza nell'ambito della statistica medica e confronto con il paradosso di Simpson*. Laurea in Statistica. 22 October 2020
- ✓ Francesca Beraldi: *Evaluation of the differentiability of classification errors in epidemiological studies based on multiple registers*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 12 February 2020.
- ✓ Duccio Borchi: *Creazione di un sistema di raccomandazione per gli utenti del sito web dell' Agenzia Regionale di Sanità Toscana*. Thesis of the laurea in "Statistica". 18 October 2019.
- ✓ Lorenzo Galluzzi: *L'uso degli alberi di regressione per l'analisi dei dati gerarchici*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 5 April 2019.
- ✓ Davide Guerra: *All'estremità della distribuzione: la legge di potenza*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 9 April 2018.
- ✓ Susi Mannozi: *Metodi di raggruppamento basati su modello delle unità di secondo livello: una applicazione alla fiducia nella politica in Europa*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 21 February 2018.
- ✓ Yaqi Deng: *Analysis of life satisfaction in Europe through random effects models: a comparison between the linear specification and the regression tree method*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 21 February 2018.
- ✓ Benedetta Bellini: *A Bayesian Multivariate Probit Model to Validate Case-Finding Algorithms In Health Science Database Studies*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 11 December 2017.
- ✓ Eni Hasa: *Analysis of the prediction ability of a university self-evaluation test: Statistical Learning methods for predicting student performance*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 9 October 2017.
- ✓ Ren Mengying: *Determinants of the performance of students in Economics at the University of Florence*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 4 April 2017.
- ✓ Costanza Tortù: *Modelli statistici a risposta ordinale per la valutazione della percezione del rischio sanitario: il caso dell'area di Livorno*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 10 October 2016.
- ✓ Francesco Innocenti: *Estimation issues in logistic multilevel models with crossed random effects: a simulation study comparing Bayesian INLA and frequentist Laplace methods*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 10 February 2016.
- ✓ Shuning Fan: *Analysis of TIMSS and PIRLS 2011 combined data using quantile regression*. Master thesis (laurea magistrale) in 'Statistica, scienze attuariali e finanziarie'. 17 December 2015.
- ✓ Dongxu Mo: *Forecasting football match results: The case of Italian Serie A*. Master thesis (laurea magistrale) in 'Statistica, scienze attuariali e finanziarie'. 17 December 2015.
- ✓ Andrea De Marco: *CUB models to study how Serum 25-Hydroxyvitamin D affects mood in Chianti residents*. Master thesis (laurea magistrale) in 'Statistica, scienze attuariali e finanziarie'. 17 December 2015.
- ✓ Giacomo De Nicola: *Bilanciamento di matrici di contabilità tramite programmazione quadratica*. Tesi di laurea in Statistica. 12 October 2015. (Prize Associazione Villa Favard for the best graduate of the School of Economics and Management – year 2015)
- ✓ Sara Biliotti: *Inference in variance components in bioassay experiments*. Master thesis (laurea magistrale) in "Statistica, scienze attuariali e finanziarie". 4 December 2014.
- ✓ Antonio Pupo: *Il Paradosso di Simpson nell'analisi statistica: Profilo storico e casi di studio*. Tesi di laurea in Economia Aziendale. 11 February 2014.

- ✓ Alessandro Bessi: *Review and advances in Quantile Regression*. Master thesis (laurea magistrale) in “Scienze Statistiche”. 16 April 2013.
- ✓ Sara Piombo: *Multilevel Analysis in Household Surveys: An Application to Health Condition Data*. Tesi di dottorato in Metodologia Statistica per la Ricerca Scientifica (XXIV ciclo), Università di Bologna. February 2013. [co-tutor]
- ✓ Silvia Metelli: *Bayesian Estimation with INLA for Logistic Multilevel Models*. Master thesis (laurea magistrale) in “Scienze Statistiche”. 20 December 2012.
- ✓ Marcella Conte: *Caratteristiche e determinanti dell'abbandono scolastico nell'area pratese*. Tesi di laurea in Statistica. 16 October 2012.
- ✓ Claudia Sani: *Valutazione degli apprendimenti degli studenti della scuola primaria italiana: un'analisi multilivello*. Master thesis (laurea magistrale) (laurea magistrale) in “Scienze Statistiche”. 19 April 2011.

### Publications: a) papers in peer-reviewed journals

1. Abramo G., D'Angelo C.A., Grilli L. (2021). The effects of citation-based research evaluation schemes on self-citation behavior. *Journal of Informetrics*. DOI: 10.1016/j.joi.2021.101204
2. Grilli L., Marino M.F., Paccagnella O., Rampichini C. (2020). Multiple imputation and selection of ordinal level 2 predictors in multilevel models: An analysis of the relationship between student ratings and teacher practices and attitudes. *Statistical Modelling*. DOI: 10.1177/1471082X20949710
3. Hasa E., Grilli L. (2019) Analysis of the prediction ability of a university self-evaluation test: statistical learning methods for predicting student performance. *Statistica Applicata - Italian Journal of Applied Statistics*, Vol. 31 (2), pp. 201-213. DOI: 10.26398/IJAS.0031-011
4. Grilli L., Rampichini C. (2019). Discussion of ‘The class of CUB models: statistical foundations, inferential issues and empirical evidence’ by Domenico Piccolo and Rosaria Simone. *Statistical Methods and Applications*. DOI: 10.1007/s10260-019-00466-w
5. Grilli L., Rampichini C. (2018). A handful of critical choices in multilevel modelling. *Boletín de Estadística e Investigación Operativa*, 34 (1).
6. Bacci S., Bartolucci F., Grilli L., Rampichini C. (2017) Evaluation of student performance through a multidimensional finite mixture IRT model. *Multivariate Behavioral Research*, 52(6): 732-746. DOI: 10.1080/00273171.2017.1361803
7. Grilli L., Innocenti F. (2017) Fitting logistic multilevel models with crossed random effects via Bayesian Integrated Nested Laplace Approximations: a simulation study, *Journal of Statistical Computation and Simulation*, 87 (14), 2689-2707, DOI: 10.1080/00949655.2017.1341886
8. Barletta V., Profili F., Gini R., Grilli L., Rampichini C., Matarrese D., Francesconi P. (2017) Impact of Chronic Care Model on diabetes care in Tuscany: a controlled before-after study. *European Journal of Public Health*. 27 (1): 8-13. DOI: 10.1093/eurpub/ckw189
9. Grilli L., Pennoni F., Rampichini C., Romeo I. (2016) Exploiting TIMSS and PIRLS combined data: multivariate multilevel modelling of student achievement. *The Annals of Applied Statistics*, 10 (4), 2405–2426. DOI: 10.1214/16-AOAS988
10. Abramo G., D'Angelo C.A., Grilli L. (2016) From rankings to funnel plots: The question of accounting for uncertainty when assessing university research performance. *Journal of Informetrics*. 10 (3), pp 854-862. DOI: 10.1016/j.joi.2016.07.005
11. Grilli L., Rampichini C. & Varriale R. (2016) Statistical modelling of gained university credits to evaluate the role of pre-enrolment assessment tests: an approach based on quantile

- regression for counts. *Statistical Modelling*. 16, pp 47-66, DOI: 10.1177/1471082X15596087
12. Abramo G., D'Angelo C.A., Grilli L. (2015) Funnel plots for visualizing uncertainty in the research performance of institutions. *Journal of Informetrics*. 9 (4) pp 954–961. DOI:10.1016/j.joi.2015.08.006
  13. Grilli L., Rampichini C., Varriale R. (2015) Binomial mixture modelling of university credits. *Communications in Statistics - Theory and Methods*. 44(22), pp 4866-4879. DOI:10.1080/03610926.2013.804565
  14. Mauro V., Biggeri M., Grilli L. (2015) Does community-based rehabilitation enhance the multidimensional well-being of deprived persons with disabilities? A multilevel impact evaluation. *World Development*, 76, pp 190-202. DOI: 10.1016/j.worlddev.2015.07.004
  15. Grilli L., Rampichini C. (2015) Specification of random effects in multilevel models: a review. *Quality & Quantity*, 49 (3), pp 967-976. DOI: 10.1007/s11135-014-0060-5
  16. Grilli L., Metelli S., Rampichini C. (2015) Bayesian estimation with INLA for logistic multilevel models. *Journal of Statistical Computation and Simulation*. 85(13), pp 2718-2726. DOI: 10.1080/00949655.2014.935377
  17. Grilli L., Varriale R. (2014) Specifying Measurement Error Correlations in Latent Growth Curve Models with Multiple Indicators. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences*, 10(4), pp 117–125. DOI: 10.1027/1614-2241/a000082
  18. Grilli L., Iannario M., Piccolo D., Rampichini C. (2014) Latent Class CUB Models. *Advances in Data Analysis and Classification*, 8(1), pp 105-119. DOI 10.1007/s11634-013-0143-5.
  19. Bertaccini B., Grilli L., Rampichini C. (2013) An IRT-MIMIC model for the analysis of university student careers. *QdS - Journal of Methodological and Applied Statistics*, 15, pp. 95-110 (ISSN: 1594-3739 eISSN: 2037-690)
  20. Visca M. et al. (2013) Group versus single handed primary care: A performance evaluation of the care delivered to chronic patients by Italian GPs. *Health Policy*, 113 (1) pp 188-198 DOI:10.1016/j.healthpol.2013.05.016. (full list of authors: Modesta Visca, Andrea Donatini, Rosa Gini, Bruno Federico, Gianfranco Damiani, Paolo Francesconi, Leonardo Grilli, Carla Rampichini, Gabriele Lapini, Carlo Zocchetti, Francesco Di Stanislao, Antonio Brambilla, Fulvio Moirano, Donata Bellentani)
  21. Francavilla F., Giannelli G.C., Grilli L. (2013) Mothers' Employment and their Children's Schooling: A Joint Multilevel Analysis for India. *World Development*, 41, pp 183–195. DOI: 10.1016/j.worlddev.2012.05.031
  22. Samuh M., Grilli L., Rampichini C., Salmaso L., Lunardon N. (2012) The use of permutation tests for variance components in linear mixed models. *Communications in Statistics - Theory and Methods*, Volume 41, Issue 16-17, pp 3020-3029. DOI: 10.1080/03610926.2011.587933
  23. Bini M., Grilli L., Rampichini C. (2011) Contextual factors of the external effectiveness of the university education: a multilevel approach. *Statistica Applicata - Italian Journal of Applied Statistics*. 23 (1), pp 51-65.
  24. Sani C. & Grilli L. (2011) Differential variability of test scores among schools: a multilevel analysis of the fifth-grade Invalsi test using heteroscedastic random effects. *Journal of Applied Quantitative Methods*, 6 (4), pp 88-99.
  25. Bartolucci F. & Grilli L. (2011) Modelling partial compliance through copulas in a principal stratification framework. *Journal of the American Statistical Association*, 106, pp. 469-479. DOI: 10.1198/jasa.2011.ap09094

26. Grilli L. & Rampichini C. (2011) The role of sample cluster means in multilevel models: a view on endogeneity and measurement error issues. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences*. 7(4): 121–133. DOI: 10.1027/1614-2241/a000030
27. Grilli L. & Rampichini C. (2010) Selection bias in linear mixed models. *Metron: International Journal of Statistics*. vol. LXVIII, n. 3, pp 309-329. DOI: 10.1007/BF03263542
28. Grilli L. & Mealli F. (2008) Nonparametric Bounds on the Causal Effect of University Studies on Job Opportunities Using Principal Stratification. *Journal of Educational and Behavioral Statistics*, 33(1), pp 111-130. DOI: 10.3102/1076998607302627
29. Grilli L. & Rampichini C. (2007) Multilevel factor models for ordinal variables. *Structural Equation Modeling*, 14(1), pp 1-25. DOI:10.1080/10705510709336734
30. Grilli L. & Rampichini C. (2007) A multilevel multinomial logit model for the analysis of graduates' skills. *Statistical Methods and Applications*, 16(3), pp 381-393. DOI: 10.1007/s10260-006-0039-z
31. Testa M.R. & Grilli L. (2006) The Influence of Childbearing Regional Contexts on Ideal Family Size in Europe. *Population*, 61(1-2), pp 109-138.
32. Grilli L. (2005) The random effects proportional hazards model with grouped survival data: a comparison between the grouped continuous and continuation ratio versions. *Journal of the Royal Statistical Society - Series A*, 168(1), pp 83-94.
33. Rampichini C., Grilli L. & Petrucci A. (2004) Analysis of university course evaluations: from descriptive measures to multilevel models. *Statistical Methods and Applications*, 13(3), pp 357-373. DOI: 10.1007/s10260-004-0087-1
34. Grilli L. & Pratesi M. (2004) Weighted estimation in multilevel ordinal and binary models in the presence of informative sampling designs. *Survey Methodology*, 30(1), pp 93-103.
35. Grilli L. & Rampichini C. (2003) Alternative specifications of multivariate multilevel probit ordinal response models. *Journal of Educational and Behavioural Statistics*, 28, pp 31-44.
36. Grilli L. & Rampichini C. (2002) Specification issues in stratified variance component ordinal response models. *Statistical Modelling*, 2, pp 251-264.
37. Grilli L. & Rampichini C. (2002) Scomposizione della dispersione per variabili statistiche ordinali. *Statistica*, anno LXII, n. 1, pp 111-116.
38. Biggeri L., Bini M. & Grilli L. (2001) The transition from university to work: a multilevel approach to the analysis of the time to obtain the first job. *Journal of the Royal Statistical Society - Series A*, 164 (2), pp 293-305.

**Publications: b) papers in books**

39. Vannucci G., Gottard A., Grilli L., Rampichini C. (2021) Random effects regression trees for the analysis of INVALSI data, pp. 29-34, DOI 10.36253/978-88-5518-304-8.07, in Bruno Bertaccini, Luigi Fabbris, Alessandra Petrucci, ASA 2021 Statistics and Information Systems for Policy Evaluation. Book of short papers of the opening conference, Firenze University Press, ISSN 2704-5846 (online), ISBN 978-88-5518-304-8 (PDF), DOI 10.36253/978-88-5518-304-8
40. Bassi F., Grilli L., Paccagnella O., Rampichini C., Varriale R. (2019) New insights on student evaluation of teaching in Italy. In: Alessandra Petrucci, Rosanna Verde (ed.). Springer Proceedings in Mathematics and Statistics, pp. 129-134 Springer New York LLC, ISBN:978-3-030-21157-8. DOI: 10.1007/978-3-030-21158-5\_20



41. Grilli L., Panzera A., Rampichini C. (2018) Clustering Upper Level Units in Multilevel Models for Ordinal Data. In: Mola F., Conversano C., Vichi M. (Eds.) *Classification, (Big) Data Analysis and Statistical Learning*, Springer. pp 137-144. DOI: 10.1007/978-3-319-55708-3\_15
42. Grilli L. & Rampichini C. (2012) Multilevel models for ordinal data. In: Kenett R and Salini S (eds.) *Modern Analysis of Customer Surveys: with Applications using R*. Chapter 19, pp. 391-411. Chichester: Wiley.
43. Grilli L. (2011) Causal inference through principal stratification: a special type of latent class modelling. In Fichet B, Piccolo D, Verde R, Vichi M (Eds) *Classification and Multivariate Analysis for Complex Data Structures*. Springer-Verlag Berlin Heidelberg. pp 265-270.
44. Grilli L. & Rampichini C. (2009) Multilevel models for the evaluation of educational institutions: a review. In Bini M, Monari P, Piccolo D, Salmaso L (Eds) *Statistical methods for the evaluation of educational services and quality of products*. Physica-Verlag, pp 61-80.
45. Grilli L. & Rampichini C. (2007) A Multilevel Analysis of Graduates' Job Satisfaction. In *Effectiveness of University Education in Italy: Employability, Competences, Human Capital* (L. Fabbris ed.), pp 29-42. Heidelberg: Physica-Verlag.
46. Grilli L. & Mealli F. (2007) University Studies and Employment. An Application of the Principal Strata Approach to Causal Analysis. In *Effectiveness of University Education in Italy: Employability, Competences, Human Capital* (L. Fabbris ed.), pp 219-232. Heidelberg: Physica-Verlag.
47. Gottard A., Grilli L. & Rampichini C. (2007) A chain graph multilevel model for the analysis of graduates' employment. In *Effectiveness of University Education in Italy: Employability, Competences, Human Capital* (L. Fabbris ed.), pp 169-182. Heidelberg: Physica-Verlag.

#### Publications: c) other

48. Grilli L., Rampichini C. (2021) Ordered Logit Model. In: Maggino F. (eds) *Encyclopedia of Quality of Life and Well-Being Research*. Springer, Cham. [https://doi.org/10.1007/978-3-319-69909-7\\_2023-2](https://doi.org/10.1007/978-3-319-69909-7_2023-2)
49. Bartolucci F., Grilli L., Pieroni L. (2012) Estimating dynamic causal effects with unobserved confounders: a latent class version of the inverse probability weighted estimator. MPRA Paper No. 43430.
50. Grilli L. (2012) Un paradosso statistico: l'effetto Will Rogers. *Sis-Magazine - Online Magazine della Società Italiana di Statistica*. Inserito il 24 ottobre 2012.
51. Bini M., Grilli L. & Bertaccini B. (2011) L'over education dei dottori di ricerca in Italia. Riflessioni e proposte operative. *Le nuove frontiere della Scuola. Periodico quadrimestrale di cultura, pedagogia e didattica*. N. 26 anno IX- Maggio 2011, pp. 99-109. La Medusa editrice – Marsala.
52. Grilli L. & Rampichini C. (2006) *A review of random effects modelling using gllamm in Stata*. Review written for the Multilevel Modelling Software Reviews of the *Centre for Multilevel Modelling*, University of Bristol.
53. Grilli L. & Rampichini C. (2005) Selection bias in random intercept models. *Multilevel Modelling Newsletter*, 17 (1).
54. Grilli L. & Rampichini C. (2004) Book review: *Methodology and Epistemology of Multilevel Analysis* (Daniel Courgeau ed.). *European Journal of Population*, 20(3), pp 289-291.

55. Grilli L. & Gori E. (1996) L'approccio dei processi di conteggio ai modelli di regressione per dati di durata. *Working Paper n. 69* – Department of Statistics - University of Florence. 2P Editor.

### Recent contributions at conferences

- Silvia Bacci, Bruno Bertaccini, Simone Del Sarto, Leonardo Grilli, Carla Rampichini: A random effects model for the impact of remote teaching on university students' performance. *50th Scientific Meeting of the Italian Statistical Society, Pisa (virtual), 2021*
- Carla Rampichini, Silvia Bacci, Bruno Bertaccini, Simone Del Sarto, Leonardo Grilli: A logit multilevel model for the analysis of exam success probability in the remote teaching era. *63rd World Statistics Congress (ISI), virtual, 2021*
- G. Vannucci, A. Gottard, L. Grilli, C. Rampichini: Random effects regression trees for the analysis of of INVALSI data. *Statistics and information systems for policy evaluation (ASA), Florence (virtual), 2021*
- Arpino B., Bacci S., Grilli L., Guetto R., Rampichini C. (2019) Evaluating the school effect: adjusting for pre-test or using gain scores? Accepted to be presented at the *12th Scientific Meeting of Classification and Data Analysis Group, Cassino, September 11 – 13, 2019*
- Grilli L., Marino M.F., Paccagnella O., Rampichini C.: Multiple imputation and selection of ordinal level-2 predictors in multilevel models: analysis of the relationship between student ratings and teacher beliefs and practice. *12<sup>th</sup> International Multilevel Conference. Utrecht, 8-9 April 2019.*
- Grilli L., Marino M.F., Paccagnella O., Rampichini C.: Multiple imputation and selection of ordinal level-2 predictors in multilevel models. *11th International Conference of the ERCIM WG on Computational and Methodological Statistics, Pisa, 14-16 December 2018.*
- Grilli L., Marino M.F., Paccagnella O., Rampichini C.: Multiple imputation of missing level 2 covariates in a multilevel model: analysis of the relationship between student ratings and teacher beliefs and practices. *International meeting of the Royal Statistical Society, Cardiff, 3-6 September 2018.*
- Grilli L., Marino M.F., Paccagnella O., Rampichini C.: Multilevel modelling with level 2 missing covariates: the relationship between student ratings and teacher beliefs and practices. *33rd International Workshop on Statistical Modelling, Bristol, 15-20 July 2018.*
- Grilli L., Malevolti G., Romano D.: Push and pull factors determining rural non-farm activities in Tanzania: a random effect panel analysis. *7th AIEAA Conference, Conegliano (TV), 14-15 June 2018.*
- Rampichini C., Bassi F., Grilli L., Paccagnella O., Varriale R.: Multilevel modelling with level-2 missing data: The relationship between student ratings and teacher feelings/practices. *10<sup>th</sup> International Conference of the ERCIM WG on Computational and Methodological Statistics, 16-18 December 2017, London.*
- Bassi F., Grilli L., Paccagnella O., Rampichini C., Varriale R.: Analysis of university teaching quality merging student ratings with professor characteristics and opinions. *CLADAG conference, 13-15 September 2017, Milan.*
- Bassi F., Grilli L., Paccagnella O., Rampichini C., Varriale R.: New Insights on Students Evaluation of Teaching in Italy. *Meeting of the Italian Statistical Society, 28-30 June 2017, Florence.*
- Bacci S., Bartolucci F., Grilli L., Rampichini C.: Evaluation of student performance through a multidimensional finite mixture IRT model. *Final meeting of the FIRB2012 project 'Mixture*

*and Latent Variable Models for Causal Inference and Analysis of Socio-Economic Data'*. 1-2 February 2017, Bologna.

- Bacci S., Bartolucci F., Grilli L., Rampichini C.: Evaluation of student performance through a multidimensional latent class IRT model with nonignorable missingness. *Annual meeting of the Royal Statistical Society*, Manchester, 6-8 September 2016.
- Grilli L., Rampichini C.: A latent class growth curve model for walking behaviour in an indoor mobility test. *Annual meeting of the Royal Statistical Society*, Manchester, 6-8 September 2016 (poster session).
- Grilli L., Rampichini C., Varriale R.: Statistical modelling of gained university credits to evaluate the role of pre-enrolment assessment tests: an approach based on quantile regression for counts. *Workshop on Recent Advances in Quantile and M-quantile Regression*. Pisa, 15 July 2016.
- Grilli L., Rampichini C., Varriale R.: Modelling gained university credits: mixtures vs quantile regression. *IES2016 - Bilateral Conference on Statistical Methods for service evaluation*. Bucharest, 17 June 2016.
- Bacci S., Bartolucci F., Grilli L., Rampichini C.: Evaluation of university students performance through a multidimensional finite mixture IRT model. *48th Scientific Meeting of the Italian Statistical Society*. Salerno, 8-10 June 2016.
- Grilli L., Varriale R.: Specification issues in latent growth models with multiple indicators. *International Conference on Data Science & Social Research*, Naples, 17-19 February 2016.
- Grilli L., Panzera A., Rampichini C.: Clustering upper level units in multilevel models for ordinal data. *10th Scientific Meeting of the Classification and Data Analysis Group*, Santa Margherita di Pula, 8-10 October 2015.
- Bacci S., Bartolucci F., Grilli L., Rampichini C.: A finite mixture IRT model for ordinal responses with non-ignorable missingness, *IFCS 2015*, Bologna 6-8 July 2015.
- Bacci S., Bartolucci F., Grilli L., Rampichini C.: An analysis of student performances through a finite mixture IRT model, *IES 2015 - INNOVATION AND SOCIETY*, Bari, 8-9 July 2015.
- Grilli L., Panzera A., Rampichini C.: Unsupervised clustering of upper level units in multilevel linear models. *Second internal meeting of the research group on "Mixture and Latent Variable Models for Causal Inference and Analysis of Socio-Economic Data"*, Rome, January 23-24, 2015.
- Grilli L., Pennoni F., Rampichini C., Romeo I.: Exploiting TIMSS & PIRLS combined data: multivariate multilevel modelling of student achievement. *Second internal meeting of the research group on "Mixture and Latent Variable Models for Causal Inference and Analysis of Socio-Economic Data"*, Rome, January 23-24, 2015.
- Grilli L., Pennoni F., Rampichini C., Romeo I.: Exploiting TIMSS and PIRLS combined data: multivariate multilevel modelling of student achievement. *Conference of European Statistics Stakeholders*, Rome, 24-25 November 2014.
- Grilli L., Panzera A., Rampichini C.: Unsupervised clustering of higher level units in multilevel linear models. *MBC2 - Workshop on Model Based Clustering and Classification*. Catania, September 3-5, 2014.
- Grilli L., Pennoni F., Rampichini C., Romeo I.: A multivariate multilevel model for the analysis of TIMSS & PIRLS data. *European Congress of Methodology*, Utrecht, 23-25 July 2014.
- Grilli L., Pennoni F., Rampichini C., Romeo I.: Multivariate multilevel modelling of student achievement data. *47th Scientific Meeting of the Italian Statistical Society*. Cagliari, 11-13 June 2014.

- Mauro V., Biggeri M., Grilli L.: Measuring the impact of community-based rehabilitation programs from a CA perspective: a multilevel analysis. Conference *Measuring Human Development and Capabilities in High-Income Countries*, Rome, 14-15 April 2014.

### Organization of conferences

- 13th Meeting of the Classification and Data Analysis Group. Firenze, September 9-11. Member of the organizing committee
- 49th Scientific meeting of the Italian Statistical Society. Palermo, 20-22 June 2018: member of the scientific committee
- 9th Meeting of the Classification and Data Analysis Group. Modena, 18-20 September 2013: member of the scientific committee and organizer of the scientific session "Measurement of student achievement"
- 46th Scientific Meeting of the Italian Statistical Society. Rome, 20-22 June 2012: organizer of the scientific session "Program evaluation: insights from applications in the social and biomedical sciences"
- 8th meeting of the Classification and Data Analysis Group of the Italian Statistical Society. Pavia, 7-9 September 2011: organizer of the scientific session "Statistical methods for the assessment of universities"

### Research projects

- Progetto di Ricerca Dipartimentale 2016 – Università di Padova: Advances in Multilevel and Longitudinal Modelling (coord: O. Paccagnella)
- Progetto strategico di ricerca di base Università di Firenze bando 2015: Disegno e analisi di studi sperimentali e osservazionali per le decisioni (coord: F. Mealli)
- Futuro in Ricerca 2012: Modelli mistura e a variabili latenti per l'inferenza causale e l'analisi di dati socioeconomici (coord. F. Bartolucci)
- Condizione attuale e prospettive occupazionali dei dottori di ricerca – progetto finanziato dal Comitato Nazionale per la Valutazione del Sistema Universitario (CNVSU) (31.03.09-30.11.10, coord. B. Chiandotto)
- PRIN 2008: Analisi delle strutture latenti: nuove frontiere nei metodi e nei modelli statistici (coord. P. Monari)
- PRIN 2006: Metodi e modelli statistici per la valutazione dei processi formativi (coord. P. Monari)
- FINVALI 05: Offerta formativa di secondo livello e domanda di lavoro qualificato. Progetto cofinanziato dall'INVALSI (coord. Leonardo Grilli)
- PRIN 2003: Reti bayesiane ed inferenza causale: metodologia ed applicazioni (coord. G. Consonni)
- PRIN 2002: Transizioni università-lavoro e valorizzazione delle competenze professionali dei laureati: modelli e metodi di analisi multidimensionale delle determinanti (coord. L. Fabbris)
- PRIN 2001: Reti bayesiane e modelli grafici (coord. G. Consonni)
- PRIN 1999: Valutazione della qualità, efficacia ed efficienza nei servizi alla persona, con particolare riferimento all'istruzione e alla sanità (coord. E. Gori)

## Seminars

- *An overview of multilevel modelling in the social sciences*. Expert Course of Criminology UNED – Faculty of Law Madrid, 22 February 2020
- *Multiple imputation and selection of predictors in multilevel models for analysing the relationship between student ratings and teacher beliefs and practices*. Johannes Kepler University of Linz, 10 October 2019.
- *Principal stratification: a general approach to causal inference accounting for post-treatment complications such as non-compliance and truncation*. Videoconference for the Journal Club of Pharmacoepidemiology. Agenzia Regionale di Sanità della Toscana, 11 July 2019.
- *Modelling gained university credits: mixtures vs quantile regression*. Università di Perugia, 27 November 2015.
- *Programme evaluation: the counterfactual approach*. China and Italy School of Policy. Florence, 30 October 2013.
- *Multilevel modelling for value added analysis in education*, Ludwig-Maximilians-Universität München, 24 April 2013
- *Multilevel modelling for value added analysis in education*, Università Statale di Milano, 10 December 2012
- *Causal inference through principal stratification: basic ideas and an application to the effect of university studies on job opportunities*, Universitat Pompeu Fabra Barcelona, 30 March 2012.
- *Standard models for ordinal data: proportional odds model*, Facoltà di Scienze Statistiche dell'Università di Milano-Bicocca, 7 November 2011.
- *Differential variability of test scores among schools: a multilevel analysis of the 5th grade Invalsi test using heteroschedastic random effects*, Università di Perugia, 13 May 2011.
- *Multilevel models for evaluating the effectiveness of educational institutions*, Banca d'Italia, 5 March 2010.
- *Causal inference through principal stratification: theoretical framework and application to the evaluation of university course programmes*, Università di Perugia, 21 June 2007.
- *Multilevel modelling for the evaluation of educational institutions*, Dipartimento di Scienze Statistiche dell'Università Cattolica del Sacro Cuore di Milano, 15 March 2007.
- *Modelli ordinali ad effetti casuali per la valutazione della didattica universitaria*, Università di Trieste, 4 December 2001.

## Editorial activity

- ✓ Associate Editor of the journal *Statistical Methods and Applications* (from 2012 to 2017)
- ✓ Guest editor of the special issue on *Education data mining* for the journal *data* (2021-22)
- ✓ Editor of the proceedings volume *Statistical Models and Methods for Data Science* (L. Grilli, M. Lupparelli, E. Rocco, C. Rampichini, M. Vichi eds.), Springer, 2022
- ✓ Peer-reviewing activity for the following scientific journals: *Advances in Data Analysis and Classification*, *American Sociological Review*, *Annals of Applied Statistics*, *Biometrical Journal*, *Communications in Statistics – Theory and Methods*, *Computational Statistics and Data Analysis*, *Education Economics*, *Electronic Journal of Applied Statistical Analysis*, *Empirical Economics*, *Genus*, *International Statistical Review*, *Journal of Educational and Behavioral Statistics (Outstanding Reviewer Award for 2008 and 2009)*, *Journal of Applied Statistics*, *Journal of the American Statistical Association*, *Journal of Official Statistics*, *Journal of the Royal*

*Statistical Society – Series A and C, Metron, Multivariate Behavioral Research, Psychological Methods, Psychometrika, Quaderni di Statistica, Quality and Quantity, Social Indicators, Socio-economic planning sciences, Statistical Methods and Applications, Statistica, Statistica Applicata - Italian Journal of Applied Statistics, Statistical Modelling, Statistical Papers, Statistics and Computing, SORT - Statistics and Operations Research Transactions, Structural Equation Modeling, Statistics in Medicine, WIREs Computational Statistics.*