

VITA

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EDUCATION:

1971-76 Univ. of Barcelona, Faculty of Mathematics,
B.S. in Mathematics

1983 Univ. of Barcelona, Faculty of Mathematics,
Ph.D. in Statistics

VISITING POSITIONS:

Free University of Amsterdam (1981).
University of Amsterdam (1983).
University of California, Los Angeles (1985-1987, 2008-2009).
Tinbergen Institute, The Netherlands (1991).

FIELDS OF RESEARCH:

Applied Statistics, Multivariate Analysis, Structural Equation Models (SEM), Latent-Variable Models, Modeling of Longitudinal Data.

PROFESSORSHIP:

September 1991- **Full Professor**, Department of Economics and Business, Universitat Pompeu Fabra, September 1991.

1990-1991 **Associate Professor**, Department of Economics and Business, Universitat Pompeu Fabra, September 1991.

1985-1990 **Associate Professor**, Faculty of Economics, University of Barcelona, January 1985

PUBLICATIONS:

<http://www.econ.upf.edu/~satorra/>

1. Jennrich, B. and A. Satorra (2015), “The infinitesimal jackknife and moment structure analysis using higher order moments”. To appear in Psychometrika.
2. Satorra, A (2015), “A Comment on a Paper by H. Wu and M. Browne”. To appear in Psychometrika.
3. Satorra, A. and H. Neudecker (2014), “A Theorem on the Rank of a Product of Matrices with Illustration of Its Use in Goodness of Fit Testing”. Psychometrika, 79, DOI: 10.1007/s11336-014-9438-5.
4. Jennrich, B. and A. Satorra (2014), “The Nonsingularity of Gamma in Covariance Structure Analysis of Nonnormal Data”. Psychometrika, 79 51-59.
5. Satorra, A. and P.M. Bentler (2014), “A Longitudinal Model for Repeated Cross Sectional Data with Clustering”. Proceedings of the JSM 2013 - Business and Economic Statistics Section, 3297-3311, American Statistical Association, Alexandria, VA 22314-1943
6. Oberski, D.L. and A. Satorra (2013), “Measurement error models with uncertainty about the error variance”. Structural Equation Modeling-A Multidisciplinary Journal, 20, 409-428
7. Jennrich, B. and A. Satorra (2013), “Continuous orthogonal complement functions and distribution-free goodness of fit tests in moment structure analysis”. Psychometrika, 78, 545-552
8. Bryant, F.B. and A. Satorra (2012), “Principles and Practice of Scaled Difference Chi-Square Testing”. Structural Equation Modeling, 19 , pp. 372-398
9. Mooijaart, A. and A. Satorra (2012), “Moment testing for interaction terms in structural equation modeling”. Psychometrika, 77, 65-84.
10. Mair, P., A. Satorra, and P.M. Bentler (2012), “Generating Nonnormal Multivariate Data Using Copulas: Applications to SEM”, Multivariate Behavioral Research, 47:4, 547-565.
11. Jennrich, J. and A. Satorra (2011), “Semi-parametric chi-square testing in mean structure and covariance structure analysis using projections”. UCLA Department of Statistics Papers, Preprint #: 623 620.
12. Mooijaart, A. and A. Satorra (2011), “MM versus ML estimates of structural equation models with interaction terms: robustness to non-normality of the consistency property”, UCLA Department of Statistics Papers, Preprint #: 620.
13. Bosch-Domènech, A., J. García-Montalvo and R. Nagel, and A. Satorra (2010), “A Finite Mixture Analysis of Beauty-Contest Data Using Generalized Beta Distributions”, Experimental Economics, 13 (4) 461-475.

14. Bou, J.C. and A. Satorra (2010), "Variation of firm profitability across EU countries: a multi-group structural equation approach", Organizational Research Methods, 13(4), 738-766.
15. Satorra, A. and P.M. Bentler (2010), "Ensuring Positiveness of the Scaled Difference Chi-square Test Statistic", Psychometrika, 75 (2), 243-248.
16. Bentler, P.M. and A. Satorra (2010), "Testing Model Nesting and Equivalence", Psychological Methods, 15 (2), 111-123.
17. Mooijaart, A. and A. Satorra (2009), "On insensitivity of the chi-square model test to non-linear misspecification in structural equation models", Psychometrika, 74 , 443-455.
18. Costa, A., A. Satorra and E. Ventura (2009), "On the performance of small-area estimators: fixed vs. random area parameters", Statistics and Operations Research Transactions, 33, 85-104.
19. Saris, W.E., A. Satorra and W. van der Veld (2009), "Testing Structural Equation Models or Detection of Misspecifications?". Structural Equation Modeling, 16, 561-582.
20. Bentler, P.M., A. Satorra and K.-H. Yuan (2009), "Smoking and Cancers: Caserobust Analysis of a Classical Data Set", Structural Equation Modeling, 16, 382-390.
21. Bou, J.C. and A. Satorra (2007), "The Persistence of Abnormal Returns at Industry and Firm Levels: Evidence from Spain", Strategic Management Journal, 28 (7): 707-722.
22. Bou, J.C. and A. Satorra (2007), "Patterns of Persistence of Abnormal Returns: A Finite Mixture Distribution Approach, in Longitudinal Models in the Behavioral and Related Sciences" (van Montfort, K., Oud J. and Satorra, A. eds.), Lawrence Erlbaum Associates, Inc., Publishers, New Jersey.
23. Costa, A., Satorra, A and E. Ventura (2006), "Improving small area estimation by combining surveys: new perspectives in regional statistics", SORT 30, 101-122.
24. Costa, A., Satorra, A. Ventura, E. (2006), "Improving small area estimation by combining surveys: new perspectives in regional statistics", Statistics and Operations Research Transactions, 30, 101-122.
25. Costa, A., Satorra, A. Ventura, E. (2004), "Using composite estimators to improve both domain and total area estimation", Statistics and Operations Research Transactions, 28, 69-86.
26. Saris, Satorra A. and G. Coenders (2004), "A New Approach for Evaluating the Quality of Measurement Instruments: Split Ballot MTMM Design", Sociological Methodology, 34, 311-347.
27. Costa, A., Satorra, A. and Ventura, E. (2003), "An empirical evaluation of small area estimators", Statistics and Operations Research Transactions, 27, 113-135.

28. Satorra, A. and H. Neudecker (2003), "A matrix equality useful in goodness-of-fit testing of structural equation models", Journal of Statistical Planning and Inference, 114, 63-80.
29. Neudecker, H. and A. Satorra (2003), "On best affine prediction", Statistical Papers, 44, 257-266.
30. Satorra, A. (2003), "Power of chi-square Goodness-of-fit test in structural equation models: the case of non-normal data", in New Developments of Psychometrics, H. Yanai, A. Okada, K. Shigemasu, Y. Kano and J.J. Meulman (eds.), 57-68, Springer Verlag, Tokyo.
31. Costa, A. Satorra & E. Ventura (2003), "An empirical evaluation of five small area estimators", SORT, 27, 113-136.
32. Rivera, P. and A. Satorra (2002), "Analysing Group Differences: A Comparison of SEM Approaches"; in Latent Variable and Latent Structure Models (G. Marcoulides and I. Moustaki, eds.), 86-104, Lawrence Erlbaum Associates, Inc., Publishers.
33. Bosch-Domènech, A., J. García-Montalvo and R. Nagel, and A. Satorra (2002), "One, Two, (Three),... Infinity,...: Newspapers and Lab Beauty-Contest Experiments", The American Economic Review, 92 (5), 1687-1701.
34. Satorra, Albert (2002), "Asymptotic robustness in multiple group linear-latent variable models", Econometric Theory, 18, 297-312.
35. Satorra, Albert and Bentler, Peter M. (2001). "A scaled difference chi-square test statistic for moment structure analysis", Psychometrika, 66, 507-514.
36. Satorra, A. (2001), "Goodness of fit testing of structural equation models with multiple group data and nonnormality" in Structural Equation Modeling, Present and Future: A Festschrift in Honor of Karl Jöreskog, 231-256 Cudeck, Robert, du Toit, Stephen and Srbom, Dag Scientific Software International (Lincolnwood, IL)
37. Bentler, P.M. and Satorra, A. (2000), "Hierarchical regression without phantom factors", Structural Equation Modeling, 7, 287-291.
38. Satorra, A. (2000), "Scaled and adjusted restricted tests in multi-sample analysis of moment structures", Innovations in Multivariate Statistical Analysis: A Festschrift for Heinz Neudecker, 233-247 Heijmans, R.D.H. (ed.), Pollock, D.S.G. (ed.) and Satorra, A. (ed.) Kluwer Academic Publishers Group (Dordrecht; Norwell, MA).
39. Satorra, A. and Neudecker, H. (1997), "Compact matrix expressions for generalized Wald tests of equality of moment vectors", Journal of Multivariate Analysis, 63, 259-276.
40. Coenders, G., Satorra, A. and Saris, W.E. (1997), "Alternative approaches to structural modeling of ordinal data: A Monte Carlo study", Structural Equation Modeling, 4, 261-282.
41. Satorra, A. (1997), "Fusion of data sets in multivariate linear regression with errors-in-variables" Classification and Knowledge Organization. Proceedings of the 20th Annual

Conference of the Gesellschaft für Klassifikation, 195-207 Klar, Rüdiger (ed.), Klar, Rudiger (ed.), Klar, Ruediger (ed.) and Opitz, Otto (ed.) Springer-Verlag Inc (Berlin; New York) Keywords: Generalized least squares.

42. Neudecker, H. and Satorra, A. (1996) "The algebraic equality of two asymptotic tests for the hypothesis that a normal distribution has a specified correlation matrix", Statistics & Probability Letters, 30, 99-103.
43. Espinal-Berenguer, A. and Satorra, A. (1996), "Survival analysis with measurement error on covariates COMPSTAT", Proceedings in Computational Statistics, 12th Symposium, 253-258 Prat, Albert. (ed.) Physica-Verlag Ges.m.b.H (Heidelberg)
44. Muthén, B.O., and Satorra, A. (1995), "Technical aspects of Muthén's LISCOMP approach to estimation of latent variable relations with a comprehensive measurement model", Psychometrika, 60, 489-503.
45. Satorra, A. and Neudecker, H. (1994), "On the asymptotic optimality of alternative minimum-distance estimators in linear latent-variable models", Econometric Theory, 10, 867-883.
46. Satorra, A. and Bentler, P.M. (1994), "Corrections to test statistics and standard errors in covariance structure analysis", Latent Variables Analysis. Applications for Developmental Research, 399-419 von Eye, Alexander (ed.) and Clogg, Clifford C. (ed.) Sage Publications Inc (Newbury Park, CA; London).
47. Satorra, A. (1993), "Asymptotic robust inferences in multi-sample analysis of augmented-moment structures" (STMA V36 4950) Multivariate Analysis: Future Directions, 2, 211-229 Cuadras, Carlos María (ed.), Cuadras, Carlos Maria (ed.) and Rao, C. R. (ed.) Elsevier/North-Holland [Elsevier Science Publishing Co., New York; North-Holland Publishing Co., Amsterdam] (New York; Amsterdam).
48. Satorra, A. (1993) "Multi-sample analysis of moment-structures: Asymptotic validity of inferences based on second-order moments". Statistical Modelling and Latent Variables, 283-298 Haagen, K. (ed.), Bartholomew, D. J. (ed.) and Deistler, M. (ed.) Elsevier/North-Holland [Elsevier Science Publishing Co., New York; North-Holland Publishing Co., Amsterdam] (New York; Amsterdam).
49. Saris, W.E. and Satorra, A. (1993), "Power evaluations in structural equation models" Testing Structural Equation Models, 181-204 Bollen, Kenneth A. (ed.) and Long, J. Scott (ed.) Sage Publications Inc (Newbury Park, CA; London).
50. Satorra, A. (1992), "Asymptotic robust inferences in the analysis of mean and covariance structures", Sociological Methodology, 22, 249-278. Keywords: Structural equation model.
51. Satorra, A. (1992), "The variance matrix of sample second-order moments in multivariate linear relations", Statistics & Probability Letters, 15, 63-69.

52. Chou, Chih-Ping, Bentler, P. M. and Satorra, Albert (1991), "Scaled test statistics and robust standard errors for non-normal data in covariance structure analysis: A Monte Carlo study", British Journal of Mathematical and Statistical Psychology, 44, 347-358.
53. Neudecker, H. and Satorra, A. (1991), "Simple proof of a general matrix equality South", African Statistical Journal, 25, 79-82.
54. Satorra, A., Saris, W. E. and de Pijper, W. M. (1991), "A comparison of several approximations to the power function of the likelihood ratio test in covariance structure analysis", Statistica Neerlandica, 45, 173-185.
55. Neudecker, H. and Satorra, A. (1991), "Linear structural relations: Gradient and Hessian of the fitting function", Statistics & Probability Letters, 11, 57-61
56. Satorra, A. and Bentler, P.M. (1990), "Model conditions for asymptotic robustness in the analysis of linear relations", Computational Statistics & Data Analysis, 10, 235-249.
57. Satorra, A. (1990), "Robustness issues in structural equation modeling: A review of recent developments", Quality & Quantity, 24, 367-386.
58. Satorra, A. (1989), "Alternative test criteria in covariance structure analysis: A unified approach", Psychometrika, 54, 131-151.
59. Satorra, A. and Bentler, P.M. (1988), "Scaling corrections for chi-square statistics in covariance structure analysis", ASA Proceedings of the Business and Economic Statistics Section, 308-313 American Statistical Association (Alexandria, VA).
60. Saris, W.E., Sorbom, D., Satorra, A. and Sörbom, D. (1987), "The detection and correction of specification errors in structural equation models", Sociological Methodology, 17, 105-129.
61. Satorra, A, Saris, W.E. and De Pijper, W.M. (1987), "A comparison of several approximations to the power function of the likelihood ratio test in covariance structure analysis", ASA Proceedings of the Business and Economic Statistics Section, 393-398 American Statistical Association (Alexandria, VA).
62. Satorra, A. and Bentler, P.M. (1986), "Some robustness properties of goodness of fit statistics in covariance structure analysis", ASA Proceedings of the Business and Economic Statistics Section, 549-554 American Statistical Association (Alexandria, VA).
63. Satorra, A. and Saris, W.E. (1985), "Power of the likelihood ratio test in covariance structure analysis", Psychometrika, 50, 83-90.

BOOKS (CO--EDITOR):

1. Montfort, K, Oud, J.H.L. and Satorra, A. (2010) (Eds.) Longitudinal Research with Latent Variables Springer Verlag, New York.
2. Montfort, K, Oud, J.H.L. and Satorra, A. (2007) (Eds.) Longitudinal models in the behavioral and related sciences, Lawrence Erlbaum Associates, Inc., Publishers, New Jersey.
3. Montfort, K, Oud, J.H.L. and Satorra, A. (2004) (Eds.) Recent developments on structural equations models: theory and applications, Kluwer Academic Publishers (2004).
4. Heijmans, D.D.H., Pollock, D.S.G. and Satorra, A. (2000), Innovations in Multivariate Statistical Analysis: A Festschrift for Heinz Neudecker, Kluwer Academic Publishers, Dordrecht web.

EDITORIAL WORK:

Reviewing for Scientific Journals (Psychometrika, Annals of Statistics, Journal of Multivariate Analysis, Journal of the American Statistical Association, among others).

Associate Editor, Structural Equation Modeling, an Interdisciplinary Journal, since its inception in 1993.

Associate Editor, Psychometrika, since 1996.

RESEARCH PROJECTS:

1. “Métodos para Modelos de Ecuaciones Estructurales no Lineales y Aplicaciones a las Ciencias Sociales y del Comportamiento”. Ministerio de Ciencia e Innovación, ECO2011-28875; 01/01/2012-30/12/2015.
2. “Modelado Multivariante con Variables Latentes: Datos de Diseño Complejo, Causalidad y Aplicaciones”, Ministerio de Educación y Ciencia, MCYT SEJ2006-13537, 01/10/2006-30/09/2011.
3. “Análisis Multivariante de Datos Longitudinales”, Ministerio de Educación y Ciencia, MCYT SEC2003-04476, 01/01/2004-19/12/2006.
4. “Modelización Estadística con Variables Latentes: Datos de diseño Complejo”, Ministerio de Educación y Cultura, BEC2000-0983, 19/12/2000-19/12/2003.
5. “Modelización Multivariante de Datos Longitudinales”, Ministerio de Educación y Cultura, DGES PB96-0300, 15/12/1997-15/12/2000.
6. “Modeling with Latent Variables and Multiple Sample”, United Kingdom Economic and Social Research Council, 10/01/1996-10/01/1999. Andrew Pickles (King’s College, London).

7. “Modelización Estadística de Datos de Panel: Datos de Muestra Múltiple”, Ministerio de Educación y Ciencia, DGICYT PB93-0403, 27/07/1994-07/27/1997.
8. “Modelización Estadística de Datos de Panel”, Ministerio de Educación y Ciencia, DGICYT PB91-0814, 01/07/1992-01/07/1994.
9. “Modelos de Ecuaciones Estructurales”, Ministerio de Educación y Ciencia, DGICYT PS89-0040, 1990/01/01-1992/31/12.

PROFESSIONAL AFFILIATIONS:

Regular Member of the International Statistical Institute

Member of The American Statistical Association

Member of The American Mathematical Society

Member of The Psychometric Society

Member of Sociedad de Estadística e Investigación Operativa (Spain).

SHORT COURSES & SEMINARS:

Two weeks course on “Advanced Causal Modeling” at The eighteenth Essex summer school in social science data analysis and collection, University of Essex, August 1985

Lecturing at the Interuniversity Graduate School of Psychometrics and Sociometrics (IOPS), University of Amsterdam, November 1989.

Graduate Course, Latent Variable Models, Tinbergen Institute (Erasmus University, University of Amsterdam, Free University of Amsterdam), The Netherlands., 1995

Graduate Course, Theory and Practice of Structural Equation Modelling, Vienna, University of Economics and Business, December 2 -10, 2010.

Program Director of the Applied Statistics Week, IDEC of UPF, in Barcelona. Years 1995 till 2010.

Miscellaneous Academic Activities:

Member of the Panel for Evaluation of the departments of Economics and Statistics, of the University of Uppsala. May 2011. See KoF, Quality and Renewal 2011, An Overall Evaluation of Research at Uppsala University. Uppsala Universitet, 2011.

Barcelona, February 20, 2015