

CURRICULUM VITAE
(updated 12/23/2005)

NAME Albert Satorra

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Universitat Pompeu Fabra
Department of Economics and Business
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DATE OF BIRTH : 8 July 1951
PLACE OF BIRTH: Manresa, Barcelona
NATIONALITY: Spanish

DEGREES

Ph.D. in Mathematics, Universitat de Barcelona, 1983
Llicenciat en Ciències Matemàtiques, Universitat de Barcelona, 1975

CURRENT POSITION

Professor of Statistics
Department of Economics and Business
Universitat Pompeu Fabra
October 1991 -

PREVIOUS POSITIONS

Associate Professor
Department of Economics and Business
Universitat Pompeu Fabra
1990-1991

Associate Professor
Universitat de Barcelona
1985-1990

Lecturer
Universitat de Barcelona
1976-1985

Teaching Assistant
Universitat de Barcelona
1976-1985

VISITING APPOINTMENTS

Visiting Researcher, University of Amsterdam
1991 (2 months)
Visiting Researcher, University of California, Los Angeles
1988 (3 months)
Visiting Scholar, University of California, Los Angeles
1985-1987 (2 years)
Visiting Researcher, University of Amsterdam
1984 (4 months)
Visiting Researcher, University of Amsterdam
1981-1982 (1 year)

FUNDED RESEARCH

(Principal Researcher: A. Satorra)

Financed by the Spanish Ministry of Science and Education

DGICYT PS89-0040 (“Modelos de Ecuaciones Estructurales”)

1990 - 1992

DGICYT PB91-0814 (“Modelización Estadística de Datos de Panel”)

07-1-1992 - 07-01-1994

DGICYT PB93-0403 (“Modelización Estadística de Datos de Panel: Datos de Muestra Múltiple”)

27-07-1994 - 27-07-1997

DGES PB96-0300 (“Modelización Multivariante de Datos Longitudinales”)

15-12-1997 - 15-12-2000

BEC2000-0983 (“Modelización Estadística con Variables Latentes: Datos de diseño Complejo”)

19-12-2000 - 19-12-2003

SEC2003-04476 (“Análisis Multivariante de Datos Longitudinales”)

10-12-2003 - 09-12-2006

Financed by DURSI (Generalitat de Catalunya)

Grup de Recerca de Qualitat (Grup de Recerca en Estadística i Investigació Operativa)

2003 - 2005

PUBLICATIONS IN REFEREED JOURNALS

“A New Approach for Evaluating the Quality of Measurement Instruments: Split Ballot MTMM Design”, *Sociological Methodology*, **34**, 311-347 (2004) (with W.E. Saris, A. Satorra and G. Coenders)

“Improving both domain and total area estimation by composition”, *SORT* **28** (1), pp. 69-86 (with Alex Costa and Eva Ventura), 2004

“A matrix equality useful in goodness-of-fit testing of structural equation models”, *Journal of Statistical Planning and Inference*, **114**, 63-80, (2003) (with H. Neudecker)

“On best affine prediction”, *Statistical Papers*, **44**, 257-266 (2003) (with H. Neudecker)

“An empirical evaluation of five small area estimators”, *SORT*, **27**, 113-136, (2003) (with A. Costa and E. Ventura)

“One, Two, (Three), ... Infinity, ...: Newspapers and Lab Beauty-Contest Experiments”, *The American Economic Review*, **92** (5), 1687-1701 (2002) (with A. Bosch-Domènech, J. García Montalvo and R. Nagel)

“Asymptotic robustness in Multiple Group Linear-Latent Variable Models”, *Econometric Theory*, **18**, 297-312, (2002)

“Estimadores Compuestos en Estadística Regional: una Aplicación a la Estimación de la Tasa de Variación de la Ocupación en la Industria”, *Qüestió*, **26** (1-2), 213-243, (2002) (with A. Costa and E. Ventura)

“A Scaled Difference Chi-square Test Statistic for Moment Structure Analysis”, *Psychometrika*, **66**, 507-514 (2001) (with P.M. Bentler)

“Product Expenditure Patterns in the ECPF survey: An Analysis using multiple group latent-variable models”, *Qüestió*, **25**, 93-117., (2001) (with E. Ventura).

“Hierarchical Regression Without Phantom Factors”, *Structural Equation Modeling*, **7**, 287-291, (2000)

(with P.M. Bentler)

“Alternative Approaches to Structural Modeling of Ordinal Data: A Monte Carlo Study”, *Structural Equation Modeling*, 4 (4), pp. 261-282 (1997)

“Compact Matrix Expressions for Generalized Wald Tests of Equality of Moment Vectors”, *Journal of Multivariate Analysis*, 63, 259-276, (1997) (with H. Neudecker)

“The algebraic equality of two asymptotic tests for the hypothesis that a normal distribution has a specified correlation matrix”, *Statistics and Probability Letters*, 30, 99-103, (1996) (with H. Neudecker)

“Complex Sample Data in Structural Equation Modeling”, *Sociological Methodology*, 25, 267-316, (1995) (with B. Muthén)

“Technical aspects of Muthen's LISCOMP approach to estimation of latent variable relations with a comprehensive measurement model”, *Psychometrika*, 60, 489-503, (1995) (with B. Muthén)

“On the asymptotic optimality of alternative minimum-distance estimators in linear latent-variable models”, *Econometric Theory*, 10, 867-883, (1994) (with H. Neudecker)

“Asymptotic robust inferences in the analysis of mean and covariance structures”, *Sociological Methodology*, 22, pp. 249-278, (1992)

“The variance matrix of sample second-order moments in multivariate linear relations”, *Statistics and Probability Letters*, 15, 63-69, (1992) (with H. Neudecker)

“Simple proof of a general matrix equality”, *South African Statistical Journal*, 25, pp. 7-10, (1991) (with H. Neudecker)

“A comparison of several approximations of the power function of the likelihood ratio test in covariance structure analysis”, *Statistica Neerlandica*, 45, pp. 173-185, (1991) (with W.E. Saris & W. M. de Pijper)

“Scaled Test Statistics and Robust Standard Errors for Nonnormal Data in Covariance Structure Analysis: A Monte Carlo Study”, *British Journal of Mathematical and Statistical Psychology*, 44, 347-357, (1991) (with C.C. Chou and P.M. Bentler)

“Robustness issues in structural equation modeling: a review of recent developments”, *Quality & Quantity* 24, 367-386, (1990)

“Gradient and Hessian of the fitting function”, *Statistics & Probability Letters*, 11, 57-61, (1991) (with H. Neudecker)

“Alternative Test Criteria in Covariance Structure Analysis: A Unified Approach”, *Psychometrika*, 54, 1, 131-151, (1989)

“Model Conditions for Asymptotic Robustness in the Analysis of Linear Relations”, *Computational Statistics & Data Analysis*, 10, 235-249, (1990) (with P.M. Bentler)

“Detection and Correction of Specification on Errors in Structural Equation Models”, *Sociological Methodology* 17, 105-129 (1987) (with W. E. Saris and D. Sörbom)

“Power of the likelihood ratio test in covariance structure analysis”, *Psychometrika*, 50, 1, 83-89 (1985) (with W.E. Saris)

BOOK CHAPTERS (RESEARCH PAPERS)

“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), pp. 57-68, Springer Verlag, Tokyo, 2003.

“Analysing Group Differences: A Comparison of SEM Approaches” in *Latent Variable and Latent Structure Models* (G. A. Marcoulides and I. Moustaki, Edts.), pp. 85-104 Lawrence Erlbaum Associates, Inc, Publishers, New Jersey, 2002 (with Pilar Rivera)

“Goodness of fit testing of structural equation models with multiple group data and nonnormality” in *Structural Equation Modeling: Present and Future*, R. Cudeck, S. Du Toit & D. Sörbom (eds.), Scientific Software International, Lincolnwood, IL (2001)

“ Scaled and Adjusted Restricted Tests in Multi-Sample Analysis of Moment Structures” in *Innovations in Multivariate Statistical Analysis: A Festschrift for Heinz Neudecker*, 233-247, Heijmans, D.D.H., Pollock, D.S.G. and Satorra, A. (eds.), Kluwer Academic Publishers, Dordrecht, (2000)

“ Multivariate Regression with Errors in Variables: Issues on Asymptotic Robustness” in *Latent Variable Modeling and Applications to Causality* pp. 211-228, Springer Verlag: London, (1996)

“ Power Evaluations in Structural Equation Models”, in K. A. Bollen and S. Long (eds.) *Testing in Structural Equation Models*, pp. 181-204, Sage University Press: London, (1992) (with W.E. Saris)

“ Multi-Sample Analysis of Moment-Structures: Asymptotic Validity of Inferences Based on Second-Order Moments” in *Statistical modeling and latent variables* (K. Haagen, D.J. Bartholomew, M. Deistler, eds.), pp. 283-298, North-Holland: Amsterdam, (1993)

“Asymptotic Robust Inferences in Multi-Sample Analysis of Augmented-Moment Matrices”, in *Multivariate Analysis: Future Directions 2*, pp. 211-229 (C.R. Rao, C.M. Cuadras, eds.), Amsterdam, North-Holland, (1993)

“ Correctio to test statistics and standard errors in covariance structure analysis”, in *Latent variable Analysis in Developmental Research*, pp. 285-305, A. van Eye and C.C. Clogg, (eds.), New York, Sage University Papers, (1994) (with P.M: Bentler)

“ Model equivalence and modification statistics in covariance structure analysis”, in *Developments and applications in structural equation modelling*, Schmeets, J.J.G, Odekerken, M.E.P. and van de Pol, F.J.R. (eds.), pp. 5-18, : Sociometric Research Foundation, Amsterdam, (1992) (with Luijben T., Boomsma A)

“Robustness issues in the analysis of MTMM and RMM models”, in *Evaluation of measurement instruments by meta-analysis of multitrait multimethod studies*. W.E. Saris and A. van Meurs (eds.), pp. 93-117, North-Holland: Amsterdam, (1990)

“ Characteristics of Structural Equation Models which affect the Power of the likelihood Ratio Test”, in W. E. Saris and I. N. Gallhofer (Eds.), *Sociometric Research: Vol. 2 Data Analysis*, pp. 220-236, London: Macmillan Press, (1988) (with Saris, W.E.. and J. den Ronden).

“Testing structural equation models”, in P.F. Cuttance y J.R. Escob (eds.), *Estructural Modeling by Example: Applications in Educational, Sociological, and Behavioral Research*. pp. 202-220, Cambridge: Cambridge University Press, (1987) (with W.E. Saris)

“ The accuracy of a procedure for calculating the power of the likelihood ratio test as used within LISREL framework”, *Sociometric Research 1982*, pp.127-190 (1983), Amsterdam: SSO.

BOOKS (EDITOR)

“Innovations in Multivariate Statistical Analysis: A Festschrift for Heinz Neudecker”, Kluwer Academic Publishers, Dordrecht, (2000) (Eds, Heijmans, D.D.H., Pollock, D.S.G. and A. Satorra)
<http://www.wkap.nl/prod/b/0-7923-8636-1>

"Recent developments on structural equations models: theory and applications"

Kluwer Academic Publishers, 2004, (Eds, Kees van Montfort , Han Oud and Albert Satorra)
<http://www.wkap.nl/prod/b/1-4020-1957-2>

"Longitudinal Models in the Behavioral and Related Science"

Lawrence Erlbaum Associates, Inc., Publisher (Eds, Kees van Montfort , Han Oud and Albert Satorra) (2006, to appear)

BOOK REVIEWS

"Estimation in structural models with non-normal distributed variables: Some alternative approaches (by K. van Montfort)", *Journal of the American Statistical Association*, 85, 910-911, (1990)

"Measurement Error Models (by W. A. Fuller)", *Journal of Educational Statistics*, 13, 4, 351-358, (1988)

PROBLEMS & SOLUTIONS

"On the Rank of a Matrix Useful in Goodness-of-Fit Testing of Structural Equation Models" , *Econometric Theory*, 18 (4), pp. 1007-1008, (with H. Neudecker)

"The justification of multidimensional scaling under euclidean conditions" *Econometric Theory* 15, p. 153, 1999 (with H. Neudecker and M. van de Velden),

"Least-squares approximation of off-diagonal elements of a variance matrix in the context of factor analysis", *Econometric Theory* 13, p. 308, *Econometric Theory* 14, p. 156-157. 1997 (with H. Neudecker),

"A fundamental matrix result on scaling in multivariate analysis", *Econometric Theory* 13, p. 890, 1997 (with H. Neudecker and M. van de Velden)

"A kronecker matrix inequality with a statistical application", *Econometric Theory*, 9, p. 524, *Econometric Theory* 11, p. 654., 1993 (with H. Neudecker)

"A matrix invariance problem" (Solution). *Econometric Theory*, 8, pp. 310-311, 1992

"Best Linear Unbiased Estimator of $R\beta$ with a Scalar Variance Matrix", (Solution) , *Econometric Theory*, 8, pp. 159-160, 1992 (with H. Neudecker),

"A Matrix Equality Applicable in the Analysis of Mean and Covariance Structures", *Econometric Theory*, 8, (p. 581-581) , 1993 (with H. Neudecker),

"A matrix invariance problem", *Econometric Theory*, 7,(p. 139). (with H. Neudecker)

"A property of the duplication matrix", *Econometric Theory*. , 6 (p. 114) (Problem) , 7, p. 144. (Solution) (with H. Neudecker)

Problema N. 23. *Qüestiió* 12,2, (1989) pp. 267-269.

Problema N. 14 *Qüestiió* 11, 2 (1987), pp. 137-148. (with M. Guillen).

Problema N. 15. *Qüestiió* 11,3 (1987), pp. 107-110, *Qüestiió* 12, 1 (1988), pp. 125-127.

OTHER PUBLICATIONS

"On the Persistence of Abnormal Returns: an Analysis Using Structural Equation Models", in *Bulletin of the International Statistical Institute*, 54th Session of the International Statistical Institute, *Proceedings*, Book 2, pp. 203-2054, (2003) (with J.C. Bou)

“ On the asymptotic distribution of chi-square based test statistics in the analysis of moment structural models “, in *Bulletin of the International Statistical Institute, ISI'97, Proceedings, Book 2*, pp. 251-254, State Institute of Statistics, Ankara, (1997)

“ Survival Analysis with Measurement Error on Covariates”, in *Proceedings in Computational Statistics* pp.. 253-258, A. Prat (Edit.), Springer Verlag: London, (1996) (with A. Espinal)

“ On the Goodness-of-fit Test in Structural Equation Models: Extreme Directions of Power”, in *Psychometric Methodology. Proceedings of the 7th European Meeting of the Psychometric Society*, pp. 457-462, R. Steyer, K.F. Wender, & K.F. Widaman (Eds), Trier, Gustav Fischer Verlag: 1993. (with W.E. Saris)

“ Model equivalence and modification statistics in covariance structure analysis”, in *Developments and applications in structural equation modelling*, Schmeets, J.J.G, Odekerken, M.E.P. and van de Pol, F.J.R. (eds.), pp. 5-18, : Sociometric Research Foundation, Amsterdam, (1992) (with Lujben T., Boomsma A)

“Goodness of Fit Test Under IV Estimation: Asymptotic Robustness of a NT Test Statistic”, in *Proceedings of the Fifth International Symposium on Applied Stochastic Models and Data Analysis* . R. Gutierrez y M.J. Valderrama (Edts.), pp. 555-567, World Scientific: London, (1991) (with P.M: Bentler)

“ Scaling Corrections for Chi-square Statistics in Covariance Structure Analysis”, *ASA 1988 Proceedings of the Business and Economic Statistics Section*, pp. 308-313, Alexandria (Virginia): American Statistical Association, (1988) (with P.M: Bentler)

“A comparison of several approximations to the power function of the likelihood ratio test in covariance structure analysis”, in *ASA 1987 Proceedings of the Business and Economic Statistics Section*, pp. 383-398, Alexandria (Virginia): American Statistical Association, (1987) (with W.E. Saris).

“ Robustness Properties of Goodness of Fit Statistics in Covariance Structure Analysis”, in *1986 Proceedings of the Business and Economic Statistics Section*, pp. 549-554 , Alexandria (Virginia): American Statistical Association, (1986) (with P.M: Bentler)

“ Introducción a los modelos de causalidad “, en *Introducción a las Técnicas de Análisis Multivariable*, pp. 217-247, J.J. Sanchez-Carrión (Edt.), Madrid, C.I.S. (1984)

RECENT (NON-PUBLISHED) WORKING PAPERS

(WP of the Department of Economics and Business, Universitat Pompeu Fabra)

“Finite Mixture Analysis of Beauty-Contest Data from Multiple Samples” (with [A. Bosch](#), [J.G. Montalvo](#), [R. Nagel](#)) (January 2004) [[737](#)]

“Using Composite Estimators to Improve both Domain and Total Area Estimation” (with [Alex Costa](#), and [Eva Ventura](#)) (December 2003) [[731](#)]

“The Persistence of Abnormal Returns at Industry and Firm Levels” (with [J.C. Bou](#)) (November 2003) [[729](#)]

PROFESSIONAL ACTIVITIES

Invited Talks:

CONGRESOS

International Symposium on Latent Variables, “Testing of Structural Equation Models with Latent Variables” , National Institute for Advanced Studies (NIAS), Holandam 1988.

Seventh International Conference in Multivariate Analysis , “Asymptotic robustness in multi-sample analysis of latent variable models” Barcelona, 1983.

Meeting of the International Society for Clinical Biostatistics, “Multisample analysis of error in variable models” , Barcelona , 1985.

50th Session of the International Statistical Institute, “Compact matrix expressions for generalized wald test of equality of moment matrices “ (with H. Neudecker), Beijing (China), 1995
20th Annual Conference of German Classification Society, “Fusion of data sets in multivariate regression with error in variables” Freiburg (Alemania) , 1996.

51th Session of the International Statistical Institute “: On the asymptotic distribution of chi-square based test statistics in the analysis of moment structural models “, Istanbul (Turquia) , 1997

Symposium on Factor Analysis and Structural Equation Models: Perspectives and Visions
“Jöreskog’s work on multiple group structural equation modeling revisited: complementary data and asymptotic robustness “ Uppsala, Suecia, 2000 (31 de Marzo, 1 de Abril)

International Symposium on Structural Equation MOdeling, “Goodness of fit testing of structural equation models with multiple group data and nonnormality” St. Charles, IL, USA
AÑO: 2000 (December 13-15, 2000)

International Meeting of the Psychometric Society, “Power of chi-square goodness of fit test in structural equation models: The case of non-normal data“, Osaka, Japón, 15-19, Julio, 2001

International Meeting of the Psychometric Society, “Testing goodness of fit in the practice of structural equation models”, Pacific Grove (Monterey), California, USA, June 14-17, 2004

Member of the following scientific societies

International Statistical Institute (Elected Member, 1994)
Institut of Mathematical Statistics
American Statistical Association
Psychometric Society
Econometric Society,

Member of the Programme Committee of

16th European Meeting of Statisticians, EMS-1991, Barcelona, Septiembre 2-6, 1991.

7th International Conference on Multivariate Analysis, Barcelona Meeting, Barcelona, 21-24, September, 1992 (in this meeting, coordinator of the session "Latent Variable Models")

Meeting of the International Society for Clinical Biostatistics (ISCB 16) . Barcelona, 31 July - 4 August, 1995 (in this meeting, coordinator of the session" Latent Variable Models in Biomedical Research")

Fifth International Conference on Social Science Methodology, Cologne, 3-6 October, 2000

22nd Biennial Conference of the Society for Multivariate Analysis in the Behavioural Sciences, London, July 17-19, 2000

International Meeting of the Psychometric Society, Osaka, Japan, July 15-20, 2001

7th Tartu Conference on Multivariate Análisis, Tartu, Estonia, August 7-12, 2003

International Meeting of the Psychometric Society, Cerdenya, Italia, July 15-20, 2003

24th Biennial Conference of the Society for Multivariate Analysis in the Behavioral Sciences (SMABS), Jena/Germany, July 17- 22,2004.

1st European Association for Survey Research (EASR), 11-22 July , 2005, Barcelona

Congress Organizer (International)

1993 European Meeting of the Psychometric Society, Barcelona, July 26-28, 1993.
Course & Workshops Organizer :

Co-organizer of the following Applied Statistics Week:

Statistics in the Health Sciences (1995)
Statistics in Classification and Pattern Recognition (1996)
Design and Analysis of Survey Data (1997)
Statistics in Environmental Science (1998)
Statistics in Marketing Research (1999)
Statistics in Society ((2000)
Statistics in Finances (2001)
Statistical Genetics (2002)
Statistical Modeling for Behavioral and Genetic Studies ((2003)

Organizer of the 10th and 11th edition of the Applied Statistics Week

Causal Inference, Missing Data and Measurement Error (2004)
Statistics in Law and Public Policy (2005)

Referee of Research Proposals for

National Science Foundation, Washington
Agencia Nacional de Evaluación y Prospectiva, Madrid
Open MaGW Program, Social Science Research Council, Den Haag

EDITORIAL ACTIVITIES

Member of the Editorial Board, *Structural Equation Modeling: A Multidisciplinary Journal*
1994 -

Associate Editor, *Psychometrika*
1995 -

2004 (currently): Member of the Editorial Council of the *Psychometric Society* (starting 2004).

Referee for

Sociological Methods & Research
Psychometrika
Psychological Bulletin
Computational Statistics and Data Analysis
Statistics and Probability Letters
Journal of the American Statistical Association
Journal of Business and Economic Statistics

Journal of Multivariate Analysis
Multivariate Behavioral Research
Structural Equation Modeling: A Multidisciplinary Journal,
Statistica Sinica
Econometrica
Annals of Statistics

Qüestió, SORT
Investigaciones Económicas
Revista de Economía Aplicada
Cuadernos de Economía y Dirección de la Empresa

RESEARCH INTERESTS

Multivariate Analysis
Structural Equation Models
Errors in variables
Panel Data
Finite Mixture Models
Small Area Estimation

ADDENDUM

Number of Research Periods Awards (“Tramos de Investigación”) by the Spanish Ministry of Sciences and Education: 4 periods.

December, 2005