

# Curriculum Vitae

## PERSONAL INFORMATION

Name Dr. Jean-Paul Fox  
Date of birth 20.12.1970  
Address Kafmolenhoek 29  
7546 KW Enschede  
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## PERSONAL EXPERIENCE

2018 – present **Associate Professor** at the Department of Research Methodology, Measurement and Data Analysis. Faculty of Behavioural, Management and Social Sciences, University of Twente.

*Worked on research projects to measure differential treatment effects (statistical tools for personalized healthcare). Developed Bayesian statistical methods to measure differences between treatment groups as well as differences between patients receiving the same treatment (tools for assessing individualized treatment effects). Key publications Baas, Boucherie, and Fox (2022, contributed to BIO-RESORT); Fox and Smink (2021).*

*Special issue editor of Statistical Methods in Medical Research (2021). Lead special issue on advanced statistical methods for longitudinal measurement data in medical research. (Contributions from a joint project with Prof Twisk of VUmc).*

*Contributed to a large-school intervention program in the Netherlands on data-based decision making to improve student achievement (PI Prof Visscher of UT). Developed statistical methods to measure differential effects of the intervention across schools and study programs. Key publications van Geel et al. (2016, 2019), Keuning et al. (2019).*

2013 – 2018 **(Adjunct) Professor** at the Department of Research Methodology, Measurement and Data Analysis. Faculty of Behavioural, Management and Social Sciences, University of Twente.

*Member of the OECD expert-group on the issue of measurement invariance in large-scale surveys. Contributed with a new statistical method to allow survey instruments to vary in their properties over time and countries, while measuring on a common scale to make fair comparisons between countries and over time. Key publications Van de Vijver et al. (2019), Fox et al. (2020).*

*Contributed to the project What Works When for Whom (UT), designed statistical models to examine differential treatment effects in the study of therapeutic change processes on intervention outcomes. Key publications Fox and Smink (2020), Smink et al. (2019).*

*Developed statistical methods for measuring cognitive decline from MMSE test data. Trajectories of cognitive decline can be integrated in a survival analysis. Key publications Van den Hout et al. (2015), Klein Entink et al. (2011).*

- 2017 – 2019 **DIPF Research Fellow**, German Institute for International Educational Research, Frankfurt Am Main, Germany. The object is to form a research group “Measurement Invariance Testing” with the department of “Educational Quality and Evaluation”. Together with Prof. Dr. Frank Goldhammer and Prof. Dr. Johannes Hartig and their staff.
- 2014 – 2018 **Psychometrician, Cito** (Psychometrisch Onderzoek en Kenniscentrum), Arnhem, The Netherlands. I am involved in the supervision of PhD candidates who work at Cito.
- 2007 – 2013 **Associate Professor**. Faculty of Behavioural Sciences, University of Twente. (VIDI personal grant, *Bayesian methodology for large-scale comparative research*).
- 2005 – 2007 **Assistant Professor** at the Department of Research Methodology, Measurement and Data Analysis. Faculty of Behavioural Sciences. University of Twente.
- 2001 – 2005 **Post Doc** at the Department of Research Methodology, Measurement and Data Analysis. (VENI personal grant, *Multilevel item response theory models*).
- 1997 – 2001 **PhD student** at the Department of Research Methodology, Measurement and Data Analysis. University of Twente, Netherlands.
- 1996 – 1997 **Statistician** at I&O Research. Enschede, The Netherlands.

#### EDUCATION

- 11.09.2001 **Doctorate** Department of Research Methodology, Measurement and Data Analysis. University of Twente, Enschede, The Netherlands  
Dissertation: “*Multilevel IRT: A Bayesian perspective on estimating parameters and testing statistical hypotheses*”.
- 25.03.1996 **Master’s degree** (‘Doctoraal’) in **Applied Mathematics**. University of Twente, Enschede, The Netherlands. Master Thesis: “Regularisation through prior distributions”.

#### EDUCATION ACTIVITIES

Teaching experience at undergraduate and graduate level (Research Master). Courses in *survey data analysis*, mathematics, statistics, and educational assessment.

#### Postdoctoral courses developed and taught (with co-workers):

- IOPS (Interuniversity Graduate School of Psychometrics and Sociometrics). **Bayesian Item Response Modeling**. (November, 2016, 2018, 2020)
- OMD’s Week of Methods and Statistics, **Bayesian Statistics**, 21-22 June 2016.
- IOPS (Interuniversity Graduate School of Psychometrics and Sociometrics). Analysis of Measurement Instruments: **Introduction to classical test theory, item response models and multilevel item response models**. (October, 2010)
- 39th GESIS Spring Seminar (Cologne). **Bayesian Item Response Modeling**. (February, 2010).
- A tailor-made training (NFP/ZAF/05/38) supported by the NUFFIC entitled “Evaluating and Changing Education Systems” for Human Science Research Council (HSRC), South Africa (2008).

- IOPS (Interuniversity Graduate School of Psychometrics and Sociometrics). **Advanced Computation in IRT**. (November, 2007).
- ICO (Interuniversity Centre for Educational Research). **Item Response Theory**. (March, 2007).
- IOPS (Interuniversity Graduate School of Psychometrics and Sociometrics). **Sampling-based Statistical Inference**. (April, 2003).
- IOPS (Interuniversity Graduate School of Psychometrics and Sociometrics). **Multilevel Analysis**. (March, 2003).
- ICO (Interuniversity Centre for Educational Research). **Multilevel analysis**. (March, 2001, 2002).
- ICO (Interuniversity Centre for Educational Research). **Item Response Theory**. (February, 1999).

## RESEARCH GRANTS

I have contributed to projects granted by the Dutch (NWO, innovational research incentives scheme) as well as European (IFPI) and international (NIA) funding agencies. (IFPI: *Causes and Consequences of Digital Music Piracy*, OECD PISA, *Cycle 2009, Core B: background questionnaires*, NIA: *Improving cognitive outcome precision & responsiveness with modern psychometrics*)

- 2017 Marginal Joint Modeling of Response Accuracy and Response Times. LSAC (\$198,288)
- 2016 Testing Measurement Equivalence in International Large-Scale OECD Projects. Organisation for Economic Co-operation and Development (OECD).
- 2015 Measurement invariance testing using Bayes factor. LSAC (\$47.910). The Law School and Admission Council (LSAC) is a non-profit corporation that provides unique, state-of-the-art products and services to ease the admission process for law schools. The grant provided by LSAC has been used to further develop Bayesian statistical tools to evaluate measurement invariance assumptions in item-based tests.
- 2014 Bayesian model testing in item response theory: Bayes factors (CTB/McGraw-Hill), Euro 61,077 (\$84,830). CTB is a publisher of educational assessment tests for the early learners and adult basic education markets. The grant has been used to develop Bayes factor tests for item response theory models and measurement invariance testing.
- 2013 Response time modelling and its applications (LSAC). Euro 165,308 (\$228,059). Project aimed at the joint modeling of responses and response times to make inferences about achievement and speed of working of test takers.
- 2007 NWO Vidi grant (452-07-003). Bayesian methodology for large-scale comparative research. Euro 599,057.
- 2004 NWO VENI grant (451-04-032). Multilevel item response theory models. Euro 200.000

## (Co)SUPERVISION PHD STUDENTS

Stef Baas (2020 – Present).

Konrad Klotzke (2017 – 2021). *Marginal Joint-Modelling of Response Accuracy and Response Times*.

Rosalie Gorter (2010 – 2017, VUmc, with Prof. Jos Twisk). *Longitudinal data-analysis using IRT techniques.*

Sukaesi Marianti (2013 – 2016, UT). *Contributions to the joint modeling of responses and response times.*

Jose R.S. Santos (2013 – 2016, University of Campinas, Brazil). *Skew IRT models for longitudinal data with multiple groups via Copula.*

Marieke van Geel (2011 – 2016, UT; with Prof. A. Visscher). *The effects of a training data-based decision making for primary school teams.*

Trynke Keuning (2011 – 2016, UT, with Prof. A. Visscher). *The effects of a training in data-based decision making for primary school teams at schools with students at risk.*

Josine Verhagen (2008 – 2012). *Modeling structural and measurement heterogeneity in large-scale survey research.*

Marianna Avetisyan (2008 - 2012). *Response bias and incomplete data in large-scale survey research.*

Caroline Timmers (2007-2012, UT). *Computer-based formative assessments using feedback for learning.*

Rinke H. Klein Entink (2005 – 2009, with Prof. Wim van der Linden). *Simultaneous modeling of item response and time response data with background variables.*

Joris Mulder (UU) (2006 – 2010, with Prof. Hoijtink). *Applying Bayesian methodology to inequality constrained multivariate linear models.*

Jonald Pimentel (2001 – 2005, with Prof. Glas). *Item response theory modeling with nonignorable missing data.*

Irene Hendrawan (2000 – 2004, with Prof. Glas). *The effect of item response theory model violations on practical test applications.*

#### COMMITTEES

2018-2021	Wetenschappelijke Advies Commissie (WAC lid) of Dutch Research Council.
2013-2016	Member ethics committee faculty Behavioural Sciences
2015-2016	<i>Chair Examination Committee</i> ; Faculty of Behavioural Management and Social Sciences.
2015-2016	Member, program committee, Research Master Methodology and Statistics for the Behavioral, Biomedical and Social Sciences (UT).
2015	Member Committee <i>Research Talent</i> (MaGW, NWO).

#### MISCELLANEOUS

2012–2020	UT-Program coordinator of the Research Master Methodology and Statistics for the Behavioural, Biomedical and Social Sciences.
2010-present	<i>Associate Editor</i> British Journal of Mathematical and Statistical Psychology.
2010-present	<i>Associate Editor</i> Journal of Educational and Behavioural Statistics.
2012-2016	Member of <i>De Jonge Akademie of the University of Twente</i> , (JA@UT, <a href="http://www.utwente.nl/jongeakademie">www.utwente.nl/jongeakademie</a> ).

Co-organizer Fall Meetings of SWS-VVS (Netherlands Statistical Society, Social Sciences Division).  
Co-organizer Spring Meeting of SWS-VVS (Netherlands Statistical Society, Social Sciences Division).

#### BOARD OF PSYCHOMETRIC ASSOCIATIONS

2018 – present            Board of the (International) Psychometric Society.  
2008 – present            Board of the Interuniversity Graduate School of Psychometrics and Sociometrics (IOPS).  
2006 – 2016                Member of the Board of the social sciences section of the Netherlands Society for Statistics and Operations.

#### SCHOLARSHIPS AND PRIZES

Personal grant, VIDI, 2007-2012. (600 k€). An Innovational Research Incentives Scheme (Dutch: Vernieuwingsimpuls) from the Netherlands Organisation for Scientific Research (NWO).

Personal grant, VENI, 2004-2007. (200 k€). An Innovational Research Incentives Scheme (Dutch: Vernieuwingsimpuls) from the Netherlands Organisation for Scientific Research (NWO).

International Psychometric Society Dissertation Award, 2001.

#### EARLY ACHIEVEMENT-TRACK-RECORD

#### PROFESSIONAL ACADEMIC WEBSITE LINKS

Personal Website <http://www.jean-paulfox.com/publications>  
Research gate [www.researchgate.net/profile/Jean\\_Paul\\_Fox](http://www.researchgate.net/profile/Jean_Paul_Fox)  
Google Scholar <http://scholar.google.com/citations?user=xQHPooMAAAJ&hl=nl>  
LinkedIn <https://nl.linkedin.com/pub/jean-paul-fox/6/275/a1a>

First author of 30 journal publications. Most influential publication is Fox (2010) with 641 citations. (08-02-2022)

Papers are available at [www.Jean-PaulFox.com](http://www.Jean-PaulFox.com) (Main menu item 'Publications').

1. Baas, S., Boucherie, R.J., and **Fox, J.-P.** (2022). Bayesian covariance structure modeling of multi-way nested data. arXiv, 2201.10612.
2. Santos, Jose R.S., Azevedo, Caio L.N., **Fox, J.-P.** (2021). Bayesian longitudinal item response modeling with multivariate asymmetric serial dependencies. Journal of Statistical Computation and Simulation (GSCS) .
3. **Fox, J.-P.** and Smink, W.A.C. (2021). Assessing an alternative for 'negative variance components': A gentle introduction to Bayesian covariance structure modelling for negative associations among patients with personalized treatments. arXiv, 2106.10107.
4. **Fox, J.-P.**, Klotzke, K.K., Veen, D. (2021). Generalized linear randomized response modeling using GLMMRR. arXiv, 2106.10171.
5. **Fox, J.-P.**, Klotzke, K. Simsek, A.S. (2021). LNIRT: An R Package for joint modeling of response accuracy and times. arXiv, 2106.10144.
6. Nielsen, N.M., Smink, W.A.C. & **Fox, J.-P.** (2021). Small and negative correlations among clustered observations: limitations of the linear mixed effects model. *Behaviormetrika*. DOI: 10.1007/s41237-020-

00130-8.

7. **Fox, J.-P.**, Koops, J., Feskens, R., Beinhauer, L. (2020). Bayesian covariance structure modelling for measurement invariance testing. *Behaviormetrika* 47, 385–410. DOI 10.1007/s41237-020-00119-3.
8. **Fox J-P**, Wenzel J, Klotzke K. (2020). The Bayesian covariance structure model for testlets. *Journal of Educational and Behavioral Statistics*. doi:10.3102/1076998620941204.
9. **Fox J-P.** (2020). Special issue on item response theory in medical studies. *Statistical Methods in Medical Research*, 29(4):959-961. doi:10.1177/0962280220902660.
10. Gorter R, **Fox J-P**, Eekhout I, Heymans M, Twisk J. (2020) Missing item responses in latent growth analysis: Item response theory versus classical test theory. *Statistical Methods in Medical Research*, 29(4):996-1014. doi:10.1177/0962280219897706
11. Gorter R, **Fox J-P**, Riet GT, Heymans M, Twisk J. (2020) Latent growth modeling of IRT versus CTT measured longitudinal latent variables. *Statistical Methods in Medical Research*, 29(4):962-986. doi:10.1177/0962280219856375.
12. **Fox J-P.** Reaction to “Sufficient statistics and insufficient explanations”: Use your information. (2020) *Statistical Methods in Medical Research*, 29(4):991-995. doi:10.1177/0962280219893460.
13. J Mulder, **JP Fox** (2019). Bayes factor testing of multiple intraclass correlations. *Bayesian Analysis* 14 (2), 521-552.
14. Klotzke, K., **Fox, JP**. Modeling dependence structures for response times in a Bayesian framework. *Psychometrika* 84, 649–672 (2019). DOI: 10.1007/s11336-019-09671-8
15. Klotzke, Konrad, **Fox, Jean-Paul** (2019): Bayesian covariance structure modeling of responses and process data. Frontiers. Collection. DOI: 10.3389/fpsyg.2019.01675
16. T Keuning, M van Geel, A Visscher, **JP Fox** (2019). Assessing and validating effects of a data-based decision-making intervention on student growth for mathematics and spelling. *Journal of educational measurement* 56(4), 757-792.
17. J Mulder, X Gu, A Olsson-Collentine, A Tomarken, F Böing-Messing, ... (2019). *BFpack: Flexible bayes factor testing of scientific theories in R*. arXiv preprint arXiv:1911.07728 2.
18. M van Geel, T Keuning, A Visscher, **JP Fox** (2019). Changes in educational leadership during a data-based decision making intervention. *Leadership and policy in schools* 18 (4), 628-647.
19. WAC Smink, **JP Fox**, E Tjong Kim Sang, AM Sools, GJ Westerhof, ... (2019). Understanding therapeutic change process research through multilevel modeling and text mining. *Frontiers in psychology* 10, 1186.
20. FJR Van de Vijver, F Avvisati, E Davidov, M Eid, **JP Fox**, N Le Donné, ... (2019). Invariance analyses in large-scale studies. OECD.
21. **Fox, J.-P.**, Duco Veen, and Konrad Klotzke (2019). Generalized Linear Mixed Models for Randomized Responses. *Methodology* 15:1, 1-18.
22. BP Veldkamp, M Avetisyan, A Weissman, **JP Fox** (2017). Stochastic programming for individualized test assembly with mixture response time models. *Computers in human behavior* 76, 693-702
23. **Fox, J.-P.**, Mulder, J., Sinharay, S. (2017). Bayes Factor Covariance Testing in Item Response Models, *Psychometrika*. DOI: 10.1007/s11336-017-9577-6.
24. **Fox, J.-P.**, Marianti, S. (2017). Person-Fit Statistics for Joint Models for Accuracy and Speed, *Journal of Educational Measurement*. 54 (2), 243-262. DOI: 10.1111/jedm.12143.
25. Van Geel, Keuning, T., Visscher, A., and **Fox, J.-P.** (2016). Changes in educator’s data literacy during a data-based decision making intervention. *Teaching and Teacher Education*, 64, pp. 187-198.
26. Gorter, R., **Fox, J.-P.**, Apeldoorn, A., and Twisk, J.W.R. (2016). Measurement model choice influences randomized controlled trial results. *Journal of Clinical Epidemiology*. <http://dx.doi.org/10.1016/j.jclinepi.2016.06.011>

27. Schmidt, S., Troitschanskaia, O., and **Fox, J.-P.** (2016). Pretest-Posttest-Posttest Multilevel IRT Modeling of Competence Growth of Students in Higher Education in Germany. *Journal of Educational Measurement*, 53(3), 352-367. DOI: 10.1111/jedm.12115.
28. Van Geel, Keuning, T., Visscher, A., and **Fox, J.-P.** (2016). Assessing the effects of a school-wide data-based decision-making intervention on student achievement growth in primary schools. *American Educational Research Journal*, 53, pp. 360-394.
29. **Fox, J.-P.**, and Marianti, S. (2016). Joint modeling of ability and differential speed using responses and response times. *Multivariate Behavioral Research*. <http://dx.doi.org/10.1080/00273171.2016.1171128>.
30. Keuning, T., van Geel, M., Visscher, A., **Fox, J.-P.**, and Molenaar, N. (2016). The transformation of schools' social networks during a Data-Based Decision-Making Reform. *Teachers College Record*.
31. Verhagen, A.J., Levy, R., Millsap, R.E., and **Fox, J.-P.** (2016). Evaluating evidence for invariant items: A Bayes factor applied to testing measurement invariance in IRT models. *Journal of Mathematical Psychology*. Volume 72, pp. 71–182.
32. Azevedo, C.L.N., **Fox, J.-P.** and Andrade, D.F. (2015). *International Journal of Quantitative Research in Education*, 2, 213-243.
33. Camilli, G., and **Fox, J.-P.** (2015). An aggregate IRT procedure for exploratory factor analysis. *Journal of Educational and Behavioral Statistics*, 40 (4). DOI:10.3102/1076998615589185.
34. Gorter, R., **Fox, J.-P.**, and Twisk, J.W.R. (2015). Why item response theory should be used for longitudinal questionnaire data analysis in medical research. *BMC Medical Research Methodology*, 15(1):55. DOI:10.1186/s12874-015-0050-x.
35. Van den Hout, A., **Fox, J.-P.**, and Muniz-Terrera, G. (2015). Longitudinal mixed-effects models for latent cognitive function. *Statistical Modelling*, 15(4), 366-387. DOI:10.1177/1471082X14555607.
36. Van den Hout, A., **Fox, J.-P.** and Klein Entink, R.H. (2015) Bayesian inference for an illness-death model for stroke with cognition as a latent time-dependent risk factor. *Statistical Methods in Medical Research*, 24 (6). 769 - 787. ISSN 0962-2802
37. De Jong, M.G., **J.-P. Fox**, and Steenkamp, J.E.B.M. (2015). Quantifying under- and over-reporting in surveys through a dual questioning-technique design. *Journal of Marketing Research*.
38. Trompetter, H.R., Bohlmeijer, E.T., **Fox, J.-P.**, Schreurs, K.M.G. (2015). Psychological flexibility and catastrophizing as associated change mechanisms during online Acceptance & Commitment Therapy for chronic pain. *Behaviour Research and Therapy*, 74, 50-59. DOI:10.1016/j.brat.2015.09.001.
39. Gosselt, J., van Hoof, J., Gent, B., and **Fox, J.-P.** (2015). Violent frames. Analyzing Internet Movie Database reviewers' text descriptions of media violence and gender differences from 39 years of U.S. action, thriller, crime, and adventure movies. *International Journal of Communication*, 9, 547-567. (doi: 1932–8036/20150005).
40. Azevedo, C.L.N., **Fox, J.-P.**, and Andrade, D.F. (2015). Bayesian longitudinal item response modeling with restricted covariance pattern structures. *Statistics and Computing*. (doi 10.1007/s11222-014-9518-5).
41. **Fox, J.-P.**, M. Marsman, J. Mulder, and J.A. Verhagen (2015). Complex latent variable modeling in educational assessment. *Communications in Statistics – Simulation and Computation*. (doi:10.1080/03610918.2014.939518)
42. Marianti, S., **Fox, J.-P.**, Avetisyan, M., Veldkamp, B.P., and Tijmstra, J. (2014). *Journal of Educational and Behavioural Statistics*, 39, 426-451.
43. **Fox, J.-P.**, Klein Entink, R.H., Timmers, C. (2014). The joint multivariate modeling of multiple mixed response sources: Relating student performances with feedback behavior. *Multivariate Behavioral Research*, 49, 54-66, doi:10.1080/00273171.2013.843441.
44. **Fox, J.-P.**, Klein Entink, R.H., Avetisyan, M. (2014). Compensatory and noncompensatory multidimensional randomized item response models. *British Journal of Mathematical and Statistical Psychology*, 67, 133-152.

45. **Fox, J.-P.**, Avetisyan, M., van der Palen, J. (2013). Mixture randomized item-response modeling: A smoking behavior validation study. *Statistics in Medicine*, 32(27). (doi: 10.1002/sim.5859).
46. **Fox, J.-P.** (2013). Multivariate zero-inflated modeling with latent predictors: Modeling feedback behavior. *Computational Statistics and Data Analysis*, 68, 361–374.
47. Verhagen, J.A. and **Fox, J.-P.** (2013). Longitudinal measurement in health-related surveys. A Bayesian joint growth model for multivariate ordinal responses. *Statistics in Medicine*, 32, 2988-3005.
48. Fledderus, M., Bohlmeijer, E.T., **Fox, J.-P.**, Schreurs, K.M.G., and Spinhoven, P. (2013). The role of psychological flexibility in a self-help acceptance and commitment therapy intervention for psychological distress in a randomized controlled trial. *Behaviour Research and Therapy*, 51, 142-151.
49. Mulder, J. and **Fox J.-P.** (2013). Bayesian tests on components of the compound symmetry covariance matrix. *Statistics and Computing*, 23, 109-122.
50. Verhagen, J. and **Fox, J.-P.** (2013). Bayesian Tests of Measurement Invariance. *British Journal of Mathematical and Statistical Psychology*, 66, 383-401.
51. Avetisyan, M. and **Fox, J.-P.** (2012). The Dirichet-Multinomial model for multivariate randomized Response data and small samples. *Psicologica: International Journal of Methodology and Experimental Psychology*, v33 n2, 362-390.
52. Azevedo, Caio L.N., Andrade, Dalton F. and **Fox, J.-P.** (2012). A Bayesian generalized multiple group IRT model with model-fit assessment tools. *Computational Statistics and Data Analysis*, 56, 4399-4412.
53. Van den Hout, A., **Fox, J.-P.**, and Klein Entink, R.H. (2011). Bayesian inference for an illness-death model for stroke with cognition as a latent time-dependent risk factor. *Statistical Methods in Medical Research*. (online, doi: 10.1177/0962280211426359).
54. Klein Entink, R.H. **Fox, J.-P.**, and van den Hout, A. (2011). A mixture model for the joint analysis of latent developmental trajectories and survival. *Statistics in Medicine*, 30, 2310-2325.
55. De Jong, M.G., Pieters, F.G.M., **Fox, J.-P.** (2010). Reducing social desirability bias through item randomized response: An application to measure underreported desires. *Journal of Marketing Research*, 47, 14-27.
56. Van der Linden, W.J., Klein Entink, R.H., **Fox, J.-P.** (2010). IRT parameter estimation with response times as collateral information. *Applied Psychological Measurement*, 34, 327-347.
57. Klein Entink, R.H., van der Linden, W.J., **Fox, J.-P.** (2009). A Box-Cox normal model for response times. *British Journal of Mathematical and Statistical Psychology*, 62, 621-640.
58. Klein Entink, R.H., Kuhn, J.-T., Hornke, L.F., and **Fox, J.-P.** (2009). Evaluating cognitive theory: A joint modeling approach using responses and response times. *Psychological Methods*, 14, 54-75.
59. Klein Entink, R.H., **Fox, J.-P.**, van der Linden, W.J. (2009). A multivariate multilevel approach to the modeling of accuracy and speed of test takers. *Psychometrika*, 74, 21-48.
60. **Fox, J.-P.** (2008). Bayesian item response models for complex survey data. *Proceedings of the 23rd international workshop on Statistical Modelling*. Eilers, P. (Ed.), 19-26.
61. **Fox, J.-P.**, and Wyrick, C.H. (2008). A mixed effects randomized item response model. *Journal of Educational and Behavioral Statistics*, 33, 389-415.
62. **Fox, J.-P.**, and Meijer, R.R. (2008). Using IRT to obtain individual information from randomized response data: An application using cheating data. *Applied Psychological Measurement*, 32, 595-610.
63. **Fox, J.-P.** (2008). Beta-Binomial ANOVA for multivariate randomized response data. *British Journal of Mathematical and Statistical Psychology*, 61, 453-470.
64. De Jong, M.G., Steenkamp, J.B.E.M., **Fox, J.-P.**, and Baumgartner, H. (2008). Using item response theory to measure extreme response style in marketing research: A global investigation. *Journal of Marketing Research*, 45, 104-115.
65. De Jong, M.G., Steenkamp, J.B.E.M., and **Fox, J.-P.** (2007). Relaxing cross-national measurement invariance using a hierarchical IRT model. *Journal of Consumer Research*, 34, 260-278 .



66. **Fox, J.-P.**, Klein Entink, R.H., van der Linden, W.J. (2007). Modeling of responses and response times with the package *cirt*. *Journal of Statistical Software*, 20, issue 7.
67. **Fox, J.-P.** (2007). Multilevel IRT modeling in practice. *Journal of Statistical Software*, 20, issue 5.
68. Klein Entink, R.H., **Fox, J.-P.**, Betlem, B.H.L., Roffel, B. (2007). Hierarchical process modeling: Describing within- and between-run variation. *Journal of Process Control*, 17, 349-361.
69. **Fox, J.-P.**, Pimentel, J.L., Glas, C.A.W. (2006). Fixed effects IRT model. *Behaviormetrika*, 33, 27-42.
70. **Fox, J.-P.**, & Glas, C.A.W. (2005). Bayesian modification indices for IRT models. *Statistica Neerlandica*, 59, 95-106.
71. **Fox, J.-P.** (2005). Randomized item response theory models. *Journal of Educational and Behavioral Statistics*, 30, 189-212.
72. **Fox, J.-P.** (2005). Multilevel IRT using dichotomous and polytomous items. *British Journal of Mathematical and Statistical Psychology*, 58, 145-172.
73. **Fox, J.-P.** (2004). Applications of multilevel IRT modeling. *School Effectiveness and School Improvement*, 15, 261-280.
74. **Fox, J.-P.** (2004). Modeling response error in school effectiveness research. *Statistica Neerlandica*, 58, 138-160.
75. **Fox, J.-P.** (2003). Stochastic EM for Estimating the Parameters of a Multilevel IRT Model. *British Journal of Mathematical and Statistical Psychology*, 56, 65-81.
76. **Fox, J.-P.**, & Glas, C.A.W. (2003). Bayesian modeling of measurement error in predictor variables using item response theory. *Psychometrika* 68, 169-191.

DEVELOPED SOFTWARE PACKAGES (RELATED TO BAYESIAN ITEM RESPONSE MODELLING)

(see also [www.Jean-PaulFox.com](http://www.Jean-PaulFox.com))

1. **(CRAN) R-Package LNIRT. Fox, J.-P.**, Klotzke, K., and Klein Entink, R.H. (October, 2016). Log-normal response time item response theory models. <https://cran.r-project.org/web/packages/LNIRT>.
2. **(CRAN) R-Package GLMMRR. Fox, J.-P.**, Klotzke, K., and Veen, D. (Augustus, 2016). Generalized linear mixed model (GLMM) for binary randomized response data. <https://cran.r-project.org/web/packages/GLMMRR>.
3. **Fox, J.-P.**, Klein Entink, R.H., van der Linden, W.J. (2007). Modeling of responses and response times with the package *cirt*. *Journal of Statistical Software*, 20, issue 7. (13)
4. **Fox, J.-P.** (2007). Multilevel IRT modeling in practice. *Journal of Statistical Software*, 20, issue 5. (4)
5. MIXIS (2011). Klein Entink, R.H. and **Fox, J.-P.** Bayesian mixture growth modelling with latent covariates using item response theory. [www.jean-paulfox.com](http://www.jean-paulfox.com).

MONOGRAPH

**Fox, J.-P.** (*in preparation*). Survey Sampling and Analysis: Theory and Applications Using R. Chapman and Hall/CRC Press.

**Fox, J.-P.** (2010). Bayesian Item Response Modeling: Theory and Applications. New York: Springer. ISBN 1441907416. (269 citations, Google Scholar)

THESIS

**Fox, J.-P.** (2001). Multilevel IRT: A Bayesian perspective on estimating parameters and testing statistical hypotheses. University of Twente, Enschede, Netherlands. (*2001 Psychometric Society Dissertation Award*).

#### BOOK CONTRIBUTIONS:

- 2019 Feskens R., **Fox JP.**, Zwitser R. (2019) Differential Item Functioning in PISA Due to Mode Effects. In: Veldkamp B., Sluiter C. (eds). *Theoretical and Practical Advances in Computer-based Educational Measurement. Methodology of Educational Measurement and Assessment*. Springer, Cham. [https://doi.org/10.1007/978-3-030-18480-3\\_12](https://doi.org/10.1007/978-3-030-18480-3_12).
- 2017 **Fox, J.-P.** van den Berg, S.M., and Veldkamp, B.P. (to be published). Bayesian psychometric methods. In *Handbook of Psychometric Testing*, P. Irwing, T. Booth and D. Hughes. Wiley-Blackwell.
- 2016 Van der Linden, W.J. and **Fox, J.-P.** Joint hierarchical modelling of responses and response times. In *Handbook of Modern Item Response Theory*, W.J van der Linden (Ed.), Vol 1, Chapter 29, Chapman and Hall/CRC Press.
- 2016 **Fox, J.-P.** Bayesian randomized item response theory models for sensitive measurement. In *Handbook of Modern Item Response Theory*, W.J van der Linden (Ed.), Vol 1, Chapter 28, Chapman and Hall/CRC Press.
- 2016 **Fox, J.-P.** and Glas C.A.W. Multilevel response models with covariates and multiple groups. In *Handbook of Modern Item Response Theory*, W.J van der Linden (Ed.), Vol. 1, Chapter 24, Chapman and Hall/CRC Press.
- 2010 **Fox, J.-P.**, and A. J. Verhagen (2010). Random item effects modeling for cross-national survey data. In E. Davidov & P. Schmidt, and J. Billiet (Eds.), *Cross-cultural Analysis: Methods and Applications* (pp 461-482), London: Routledge Academic. ISBN 1848728220.
- 2008 **Fox, J.-P.** (2008). Bayesian item response models for complex survey data. In Eilers, P. (Ed.), *Proceedings of the 23rd international workshop on Statistical Modelling*. pp. 19-26.
- 2004 **Fox, J.-P.** (2004). Multilevel IRT Model Assessment. In van der Ark, Croon, Sijtsma (Eds.) *New Developments in Categorical Data Analysis for the Social and Behavioral Sciences* (p. 227-252), London: Lawrence Erlbaum Associates, Inc. ISBN 0-8058-4278-6
- 2002 **Fox, J.-P.** & Glas, C.A.W. (2002). Modeling measurement error in a structural multilevel model. In G.A. Marcoulides & I. Moustaki (Eds.), *Latent Variable and Latent Structure Models* (pp. 245-269), London: Lawrence Erlbaum Associates, Publishers. ISBN 978-0805840469

#### LATEST TALKS (INCLUDING INVITED AND KEY-NOTE TALKS).

For a more complete overview: [www.Jean-PaulFox.com](http://www.Jean-PaulFox.com) (Main menu item 'Presentations').

- *Bayesian Marginal Measurement Invariance Testing*. IMPS July 2017. Zurich, Switzerland.
- *Bayesian Developments in Modeling and Prediction for LSA Data with Applications*. Coordinated Session NCME, 28 April 2017, San Antonio, Texas.
- *Generalized Bayesian Multivariate Multilevel Models for Pretest Posttest Data*. RCEC Workshop on IRT and Educational Measurement. University of Twente, October 14, 2016.
- *Dynamic Testing of Response Behaviour in Serious Games*. Seminar at Human Development and Family Studies State. College of Health and Human Development. Penn State, PA, US. 24 August, 2016.
- *Dynamic Testing of Response Behaviour in Serious Games*. Law School and Admission Council (LSAC), New Jersey, US, August 10, 2016.
- *Generalized Bayesian Measurement Invariance Testing*. Seminar at ETS, Princeton, US, July 29, 2016.
- *Bayesian Multivariate Multilevel Models for Pretest Posttest Data*. Modern Modeling Methods Conference. Storrs, University of Connecticut, 24-25 May 2016.
- *Testing Dependency Structures under an IRT Model*. Seminar at Department of Statistics, London School of Economics, London, 3 May, 2016.
- *Bayesian Item Response Models Supporting Data Harmonization*. Maelstrom Harmonization Workshop. Groningen, The Netherlands, 20-22 April, 2016.

- *Change-point Detection Methods: Identify Increase of Learning and Disengagement. Symposium on (AERA) Future Trends in Educational Assessment*, AERA, Washington, 9 April, 2016.
- *Bayesian Measurement Invariance Testing*. Mplus Users Meeting, Utrecht, 13 January, 2016.
- *Bayesian Measurement Invariance Testing*. Seminar at The German Institute for International Educational Research, Frankfurt am Main, 7 January, 2016.
- Does Time Pressure Induce Tunnel Vision? An examination with the Eriksen Flanker task. *International Conference on Applied Physics, Simulation and Computers (APSAC 2015)*. Vienna, Austria, 2015.
- Bayesian Model Testing in IRT. CTB-McGraw/Hill, R&D Symposium. Monterey, CA, 11 September, 2014.
- Exploring feedback behaviour: A multivariate multilevel modeling approach. 9th International Multilevel Conference, Utrecht, The Netherlands, March 27-28, 2013.
- *Advances in Bayesian Item Response Modeling* (Joint modeling of feedback use and time data). NCME, 16 April 2012, Vancouver (Invited session Advances in Psychometrics).
- *Random Item Effects Modeling: Applications*. Ph.D School in Psychology, Università di Milano - Bicocca. Milan, Italy. April 29, 2011. (Invited)
- *Random Item Effects Modeling: Theory*. Ph.D School in Statistics, Università di Milano - Bicocca. Milan, Italy. April 28, 2011. (Invited)
- *Joint Modeling of Longitudinal Item Response Data and Survival*. Escola de Modelos De Regressao. March 13-16, 2011. Fortaleza, Brazil. (Keynote Address)
- *Developments in Bayesian Item Response Modeling*. The 75<sup>th</sup> Meeting of the Psychometric Society. July 7 - July 9, 2010. Athens, Georgia, USA. (Invited).
- *The Joint Modeling of Individual Cognitive Impairment and Survival Data*. MTO Research Colloquium. June, 9, 2010. Tilburg University. (Invited).
- *MLIRT Modeling of Complex Survey Data*. 1<sup>st</sup> Brazilian Congress on Item Response Theory. Florianópolis, Brazil. December 9-11, 2009. (Keynote Address)
- *Random Item Effects Modeling in Cross-National Survey Research*. 1st Brazilian Congress on Item Response Theory. Florianópolis, Brazil. December 9-11, 2009. (Keynote Address)
- *Item Response Modeling of Neuropsychological Test Data*. Seminar Biostatistics, School of Public Health University of Washington, Seattle, WA, USA. September 23, 2009. (Invited).
- *Bayesian Item Response Models For Complex Survey Data*. Presentation at the 23<sup>rd</sup> International Workshop on Statistical Modelling. Utrecht. July, 8, 2008. (Invited).
- *Advanced Posterior Predictive Assessment*. Presentation at the 73<sup>th</sup> Annual Meeting of the Psychometric Society. Dover, NH, USA. July, 1, 2008.

#### REFEREE

Journals: Journal of Educational and Behavioral Statistics (*Associate Editor*), British Journal of Mathematical and Statistical Psychology (*Associate Editor*), Psychometrika, Statistics in Medicine, Psychological Methods, Applied Psychological Methods, Computational Statistics and Data Analysis, ...

National Science Foundation (NSF, USA). The Netherlands Organisation for Health Research and Development (ZonMw). The Netherlands Organisation for Scientific Research (NWO), selection committee Research Talent (2015).

#### OVERVIEW RESEARCHER

I am a well-established researcher in the area of Bayesian response modelling. I have developed a multilevel IRT model for analysing item response data and accounting for the nesting of respondents

in clusters. This hierarchical latent variable framework was the first to incorporate a complex survey design in a psychometric model. The fully-integrated model correctly specifies dependencies at different hierarchical levels and can handle disaggregated and aggregated explanatory data. I received the 2001 Psychometric Association Dissertation award for his work on multilevel IRT modelling. Currently, for secondary analysis, large-scale educational surveys such as PISA, TIMMS, and PIAAC have followed this strategy by adopting a multilevel sampling design in their psychometric measurement models.

I have developed and programmed advanced computational statistical estimation methods to support the application of Bayesian response models for complex data. The software has been published on different repositories and in the Journal of Statistical Software, and can also be found on my website ([www.Jean-PaulFox.com](http://www.Jean-PaulFox.com)). My contributions in computational statistics are focused on simulation-based methods, and concern mainly Markov chain Monte Carlo Methods. In different publications in statistical and computational journals I have described innovative estimation methods, and new computational techniques to make statistical inferences and to improve data interpretations.

My early contributions in the area of complex psychometric models have been recognized worldwide. In 2004, I received a personal grant (VENI, an innovational research incentives scheme) from the Netherlands Organisation for Scientific Research (NWO) for my research on multilevel IRT modelling. I am well-known for my work on multilevel IRT modelling and I am frequently asked to give (keynote) lectures or courses. In later years, I have developed methods, in different directions, for large-scale survey research. I have developed a new approach for dealing with measurement invariance in cross-national comparative survey research, which avoids the complex specification of anchor items. Parts of the results were published in top journals in the field of marketing research. This research was supported by a personal grant in 2007 (VIDI, an innovational research incentives scheme) from the Netherlands Organisation for Scientific Research. Other new approaches focused on model extensions to deal with background questionnaire data and retrieving sensitive survey information. I have made novel contributions integrating the randomized response technique in survey methods to obtain accurately sensitive respondent information, which are currently implemented in large-scale survey studies on excessive alcohol consumption (Netherlands) and illegal downloading behaviour (Germany).

My monograph entitled "Bayesian Item Response Modeling" was published in 2010 by Springer Science and has been positively reviewed in three excellent journals, covering research fields in statistics and psychometrics, and generally marked as an important contribution of a high technical level. A textbook about survey sampling and analysis using the statistical software R is planned to be published in 2018.

Around 2010, I developed more interest in health-related research applications. From that time, I have become more involved in projects related to Health research. I got involved in a project on *Improving cognitive outcome precision and responsiveness with modern psychometrics*, and became really interested in methodological developments to improve Health research. This research area poses many interesting challenges such as making person-specific inferences, building on data-driven solutions, and optimally exploiting the information from longitudinal measurements. As a statistician and psychometrician, I have become more and more interested in taking up these challenges and making significant contributions to improve statistical decision making in Health research.

As an example, I have published different papers on measuring and modelling cognitive decline of persons from a heterogeneous population, where a part of the population showed significant decline in cognitive function due to dementia. More complex psychometric measurement models were used to fully exploit all the information in item scores from the mini-mental state-examination.

Another example is the use of more complex psychometric item response models to measure constructs. With colleagues, I have shown that in more complex sampling designs, where clustering effects are present (e.g., patients are clustered in hospitals, measurements clustered in patients), item response models really improve the identification of the variation between and within the clusters in comparison to simple sum scores. It proves that item response models perform better than classical true score models.

In 2005 I was offered a permanent position in the Research Institute for Social Sciences and Technology at the University of Twente. As a result of the successful research activities on Bayesian psychometric response modelling I was appointed a position on September 1<sup>st</sup> 2007. I have also obtained a research position in the Institute for Innovation and Governance Studies with a focus on survey methodology in health assessment research using patient reported outcomes.