

PROGRAM OF THE 74TH ANNUAL AND 16TH INTERNATIONAL MEETING
OF THE PSYCHOMETRIC SOCIETY

The 74th Annual and 16th International Meeting and of the Psychometric Society (IMPS2009) was held at Cambridge University, England, July 20–24, 2009.

Monday, 20th July

PRESESSION WORKSHOPS

OBSERVED-SCORE TEST EQUATING: ILLUSTRATION USING THE GAUSSIAN KERNEL METHOD. Facilitator: Alina von Davier

INTRODUCTION TO ANALYSIS OF LARGE SCALE ASSESSMENT DATA USING IRT AND GENERALIZED LATENT VARIABLES. Facilitator: Matthias von Davier

GENERALIZED LINEAR LATENT AND MIXED MODELLING (GLLAMM): THE FRAMEWORK, ESTIMATION, AND SOME EXAMPLES. Facilitator: Andrew Pickles

USING THE LATENT GOLD SYNTAX FOR GENERALIZED LATENT VARIABLE MODELLING. Facilitator: Jeroen Vermunt

Tuesday, 21st July

KEYNOTE LECTURE

Bill Dickens; *What is g?*

INVITED LECTURE

Tom Minka; *Automating variational inference for statistics and data mining*

INVITED LECTURE

Carol Woods; *IRT-LR-DIF with estimation of the latent densities*

Nanny Wermuth; *Graphical and structural equation models*

STATE-OF-THE-ART LECTURE

Ellen Hamaker; *Dynamic modelling and the individual*

STATE-OF-THE-ART LECTURE

Francis Tuerlinckx; *The diffusion of diffusion models in quantitative psychology: A state of the art*

STATE-OF-THE-ART LECTURE

Jonathan Templin; *On the Origin of Species: The evolution of diagnostic modelling within the psychometric taxonomy*

BOYS SMITH SESSIONS

(01) EDUCATION RESEARCH APPLICATIONS. Chair: K. Miazaki

Y. Tseng; *The use of generalizability theory in the application of elementary writing*

C. Lin and S. Yang; *The meta-analysis of effect research of the life meaning sense in Taiwan*

T. Gaffney and C. Perryman; *A longitudinal look at the factor structure of educational achievement tests*

(40) MEASUREMENT ISSUES. Chair: K. Markus

K. A. Markus; *How can validity come in degrees?*

H. Kelderman; *Can questionnaires satisfy measurement invariance?*

G. Maris; *How to score an exam?*

CASTLEREAGH SESSIONS

(33) HIERARCHICAL MODELS AND STRUCTURE. Chair: A. Mooijaart

V. L. Willson and R. Larsen; *Modelling second level cluster dependency in multilevel models*

R. Carlson and H. Medrano; *Nested/hierarchical measures*

Y. Miyazaki; *Impact of ignoring nested data structure in IRT models*

J. González, E. San Martín, and J. Manzi; *Value-added modelling of school performance under large school variability and high selectivity*

(14) CLASSIFICATION AND CLUSTERING. Chair: V. Wilson

T. Tokuda, I. Van Mechelen, and F. Tuerlinckx; *Bayesian mixture modelling with variable selection*

H. Won Suk and H. Hwang; *Regularized fuzzy clusterwise ridge regression*

D. Kaplan and B. Keller; *Cluster effects in the Latent Class Model*

M. Lei and W. Lee; *A comparison of methods for estimating classification accuracy indices*

DIRAC SESSIONS

(16) COGNITIVE DIAGNOSIS, MIXTURES AND MIXED EFFECTS. Chair: M. Lei

H. Choi, J. L. Templin, A. S. Cohen, and R. A. Henson; *A Diagnostic classification mixture IRT model (DCMixRM)*

A. Alonso, S. Litière, and G. Molenberghs; *Misspecified random-effects distribution in generalized linear mixed models: perception and problems*

J. de la Torre and C. Chiu; *Q-Matrix Validation under the Generalized DINA Model Framework*

(18) NEW PERSPECTIVES ON SOCIAL AND PSYCHOLOGICAL PROCESSES. Chair: Y. Miyazaki

K. Abolfazlian; *How to quantitatively measure the psychological phenomena of team synergy in an organizational setting*

J. Ihme; *Construction of figural matrices tasks with predicted difficulty*

H. van der Maas; *The derivation of item response models from sequential sampling models of choice*

T. Calapez and M. Ramos; *Do different presentations of Likert-type items lead to differences in structure?: A field study using linear and non-linear PCA*

FOYER SESSIONS

POSTER SESSION

- G. Lazendic; *Modelling growth of students achievement in international competitions and assessments for schools in mathematics*
- C. Lin; *Controlling test overlap rate in the automated assembly of alternate tests*
- E. Lee; *Evaluation of equating results based on the first and second order equity properties*
- N. Iwama; *Structural Equation Modelling with selective ADF3 for reducing estimation time*
- K. Fukunaka and H. Toyoda; *Graphical modelling for factors by using rotation*
- M. Mittelhaeuser and W. Emons; *Using person-fit analysis for developing revised scales: Application to Type-D personality assessment*
- K. Nakamura; *Scale development considered reliability and validity simultaneously using a genetic algorithm*
- K. Ozaki, K. Nakamura and H. Murohashi; *Non-normal Structural Equation Modelling on multilevel data*
- Y. Miyamoto; *A factor rotation criterion log-linear model*
- M. Bennick and M. Croon; *Comparing methods for constructing confidence intervals for indirect effects in a multilevel setting with the outcome variable at team level*
- C. Ximenez; *Recovery of weak factor loadings in Confirmatory Factor Analysis under conditions of model misspecification*
- M. Tsubakimoto, M. Yanagisawa, and K. Akahori; *Examination of Aspects of Term Paper-Grading Assisted by Visualization*
- T. Ohmori and K. Shigemasa; *Bayesian diagnostic model in testlet adaptive testing*
- B. Yufang and W. Yehui; *Development of standardized Chinese Achievement Test for Junior High School students*
- H. Astatke, M. Mulatu, P. Buyungo, D. Crapper, and T. Berhanu; *Testing the applicability of a theoretical model to predict ITN use in Ethiopia*
- M. P. Michaelides; *A survey of teachers' assessment practices and conceptions on a Cypriot sample*
- B. Zhang and J. Cheema; *Modelling of achievement gaps using international test data*
- A. Bacopoulos-Viau and J. Rust; *The creation of the first psychology laboratory in Britain: Cambridge, 1886–1888*

LOWERCROFT SESSIONS

(23) STRUCTURAL EQUATION MODELS: INFERENCE. Chair: P. Malone

- W. Chan and J. L.-Y. Kwan; *Testing standardized effects in Structural Equation Modelling: A model reparameterization approach*
- P. S. Malone, A. J. Fairchild, A. Lamont, T. F. Northrup, and D. P. MacKinnon; *Confidence intervals for indirect effects in multiply imputed data*
- L. Weng and H. Liu; *The role of number of parameters for sample size consideration in Structural Equation Modelling*
- Y. Kano and K. Takai; *Should complete-case analysis always be avoided? SEM for incomplete data with non-ignorable missing*

(32) TEST EQUATING: CROSS-VALIDATION AND CONCURRENT CALIBRATION.
Chair: R. Carlson

- A. von Davier and T. Liang; *The cross validation method: an alternative to the kernel method in test equating*
- Y. Shih, B. Kuo, T. Sheu, and C. Shih; *Scale linking procedure with concurrent calibration under the three-parameter logistic testlet model*

- K. Miyazaki, T. Hoshino, and K. Shigemasu; *A new concurrent calibration method for non-equivalent group design under non-random assignment and real data analysis*
- K. Osawa; *Concurrent item calibration and logistic ability scaling of 3 large-scale Japanese language assessments of CSAT, JLPT and EJU in a population of Japanese language learners in Korea*

PALMERSTON LECTURE THEATRE SESSIONS

MEASUREMENT INVARIANCE IN EXPERIMENTAL PSYCHOLOGY, PERSONALITY RESEARCH, AND GENETICS (Symposium) Organizer and Chair: Jelte Wicherts, University of Amsterdam

- J. M. Wicherts; *Measurement invariance in psychological experiments*
- A. Zand Scholten and D. Borsboom; *Legitimate inferences based on meaningless statistics*
- C. V. Dolan, I. Smits, and Harrie C. M. Vorst; *Measurement invariance of a (Big 5) personality test with respect to cohort over a 25year period*
- S. van der Sluis, D. Posthuma, and Matthijs Verhage; *Measurement invariance in the context of genetics*

TOPICS IN CONSTRAINED OPTIMISATION (Symposium) Organizer and Chair: Casper Albers, The Open University

- F. Critchley; *Explicit minimisation of a convex quadratic under a general quadratic constraint*
- C. Albers; *Missing values in general forms of Procrustes Analysis*
- J. Gower; *Canonical Variate Analysis: Ranks, Ratios, and Fits*

UPPERCROFT SESSIONS

(22) STRUCTURAL EQUATION MODELS: FIT AND GENERALISATION. Chair: R. Millsap

- J. Lyhagen; *Non-normal structural equation modelling: Regression augmented maximum likelihood*
- D. Bauer, R. Mathiowetz, N. Gottfredson, J. Pek, and D. Losardo; *Modelling non-linear relationships among latent variables via mixtures of linear structural equations*
- A. Mooijaart and A. Satorra; *Testing for non-linear relationship in Structural Equation Modelling*
- R. Millsap and S. Lee; *Approximate fit in SEM without a priori cutpoints*

(38) PERSON FIT ANALYSIS. Chair: W. van der Linden

- S. Beland, G. Raiche, and P. Brassard Dorantes; *Correlates of personal fluctuation, pseudo-guessing, and inattention subject parameters: Relations with parametric and non-parametric person-fit statistics*
- G. Raiche, D. Magis, and J. Blais; *Multidimensional fluctuation, pseudo-guessing and carelessness IRT person parameters models*
- J. M. Conijn, M. A.L.M. van Assen, W. H.M. Emons, and K. Sijtsma; *Person-fit analysis using multilevel logistic regression*
- W. J. van der Linden; *A bivariate lognormal response-time model for the detection of collusion between test takers*

PLENARY ACTIVITIES

Pimms and Punting

Wednesday, 22nd July

KEYNOTE LECTURE

Peter Congdon; *Bayesian factor and structural equation models, issues in identification and estimation*

INVITED LECTURE

Herb Marsh; *Self-Concept Research: A substantive-quantitative synergy*

STATE-OF-THE-ART LECTURE

Richard Emsley; *Finite mixture models to look at the causal effects of process variables*

STATE-OF-THE-ART LECTURE

Elena Erosheva; *Recent developments in mixed membership modelling*

STATE-OF-THE-ART LECTURE

Andries van der Ark; *New advances in Non-parametric Item Response Theory (NIRT)*

BOYS SMITH SESSIONS

(03) PSYCHOMETRIC METHODS FOR HEALTH OUTCOMES I. Chair: C. Lalanne

C. Lalanne, M. Duracinsky, C. Acquadrom, and O. Chassany; *Descriptive and explanatory IRT modelling of a new Quality of Life questionnaire specific for HIV patients*M. Blanchin, J. Hardouin, T. Le Neel, G. Kubism, and V. Sébille; *Comparison of three methods for the analysis of longitudinal patient reported outcomes*C. Barbosa-Leiker, B. R. Wright, G. Leonard Burns, C. D. Parksm, and P. Strand; *Longitudinal measurement invariance and latent growth modelling applied to the metabolic syndrome*J. Hardouin, T. Le Néel, G. Kubis, V. Sébille, and B. Fallissard; *Power with CTT and IRT based approached for the comparison of two groups of patients*

(15) COGNITIVE DIAGNOSIS: CLASSIFICATION AND CLUSTERING. Chair: J. De la Torre

Y. Lee and J. de la Torre; *Type I error and power of the Likelihood Ratio and Wald tests under the generalized DINA model framework*C. Chiu and J. Douglas; *Finding the number of clusters and labeling clusters for profile classification in cognitive diagnosis*E. Ayers, R. Nugentm, and N. Dean; *A comparison of student skill knowledge estimates*P. Chen and H. Wu; *A sampling and classification approach to construct parallel tests based on a cognitive diagnosis model*

(46) EXPLORATORY DATA ANALYSIS. Chair: H. Kiers

M. van de Velden and Y. Takane; *Generalized canonical correlation analysis with missing values*P. J. F. Groenen, J. Gowermm, and M. van de Velden; *Area biplots*C. Strobl; *Unbiased measures of variable importance for large data sets*A. Uenlue and W. Ahmed Malik; *Interactive graphical exploration of psychometric multivariate data using glyph representations*

CASTLEREAGH SESSIONS

(35) ITEM RESPONSE THEORY: POLYTOMOUS ITEMS. Chair: M. van Onna

P. Natesan; *Bayesian estimation of graded response multilevel models*

T. Okubo, T. Hoshinomi, and S. ichi Mayekawa; *Partially ordered nominal categories model*

K. Shojima; *Neural test theory model for graded response data*

L. Shu and R. Schwarz; *Estimated reliabilities for a test containing multiple item formats*

(43) MULTIWAY/MULTIMODE ANALYSIS. Chair: P. Groenen

H. Kiers and J. M.F. ten Berge; *Comparison of PCA followed by procrustes analysis with multiset and three-way component analysis*

T. Wilderjans, E. Ceulemans, and I. Van Mechelen; *Methods for a global analysis of coupled data blocks that are subject to heterogeneity in the amount of noise*

Y. Takane and Z. Zhang; *Algorithms for DEDICOM: acceleration, deceleration, or neither?*

K. Jung, Y. Takane, and H. Hwang; *An acceleration method for ten Berge et al. algorithm for orthogonal INDSCAL (012B)*

(05) DYNAMIC AND LONGITUDINAL MODELS I. Chair: R. Tsai

T. Lodewyckx and F. Tuerlinckx; *Studying latent affective dynamics with a Bayesian state-space approach*

W. Cools, F. Tuerlinckx, and P. Kuppens; *Modelling the individual specific oscillatory evolution of emotion in continuous time*

V. Vasdekis, S. Cagnone, and I. Moustaki; *Full and limited information estimation methods for latent variable models for ordinal longitudinal data*

M. de-Rooij; *Mixed effect ideal point models for the analysis of longitudinal multinomial data*

DIRAC SESSIONS

(19) CONFIRMATORY AND LIKELIHOOD-BASED FACTOR ANALYSIS. Chair: V. Choulikian

S. McKay-Curtis and E. A. Erosheva; *An exploration of identifiability in bifactor models*

F. Yang-Wallentin, H. Luo, and K. G. Jöreskog; *Confirmatory factor analysis of ordinal variables with misspecified models*

S. Lee and I. Kim; *Approaches to handle identification problems in analysis of single indicator MTMM data*

F. Oort; *Likelihood based confidence intervals in exploratory factor analysis*

(47) SOCIAL AND EDUCATIONAL DATA ANALYSIS POTPOURRI. Chair: L. Shu

M. Gnaldi and M. Giovanna Ranalli; *The robustness of university rankings: A sensitivity analysis of the Italian scientific research indicators*

B. Clauser, M. J. Margolis, and J. Mee; *An experimental study of the use of performance data by judges in an Angoff standard setting exercise*

D. Belov and R. D. Armstrong; *A new approach to assess unusual agreement between the incorrect answers of two examinees*

R. Steyer; *The theory of causal effects and the principle of atomic stratification*

(49) METHODOLOGICAL POTPOURRI. Chair: M. Wiberg

M. van Onna and A. Béguin; *Optimizing the measurement accuracy of a test using correlated scales*

H. Yu; *Model selection methods based on the concept of predictability for longitudinal data*

B. P. Flaherty; *Model selection in latent class and mixture models: What's to be preferred?*

FOYER SESSIONS

POSTER SESSION

- A. Rawls; *The importance of test validity: An examination of measurement invariance across subgroups of a reading test*
- A. R. Delgado, G. Prieto, M. V. Perea, and V. Ladera; *Probing the Benton Visual Retention Test with the Rasch Model*
- K. Murayama; *Distinguishing controlled from automatic cognitive processes using a mixture modelling framework for a Gaussian signal-detection model*
- N. Kuga and S. Mayekawa; *New analytic solution to weighted metric unfolding*
- J. Tein and K. Blackwell; *Psychometric work of shortening the children report of the Parental Behaviors Inventory*
- S. Chen and C. Cheng; *Model specification for latent endogenous interaction and quadratic effects*
- T. Hashimoto and M. Ueno; *Kullback-Libler Divergence and item parameter estimates when one item affects another item*
- J. A. López-López, J. Sánchez-Meca, J. A. López-Pina, F. Marín-Martínez, A. I. Rosa-Alcázar, A. A. Gómez-Conesa, and R. M. Núñez-Núñez; *Methodological and statistical factors in reliability generalization: An application to the Maudsley Obsessive-Compulsive Inventory*
- F. Marín-Martínez and J. Sánchez-Meca; *Statistical factors affecting an average effect size in meta-analysis*
- J. Sánchez-Meca and J. A. López-Pina; *The Reliability Generalization Approach: A comparison of different procedures to estimate an average coefficient alpha*
- H. Liu and F. Luo; *Unidimensional and multidimensional models for dichotomous variables: A comparison of the CFA and IRT approaches*
- I. Dorofte and T. Dorofte; *To a revolution of measure in psychometrics: from IQ to PQ*
- S. Vitoratou, I. Ntzoufras, and I. Moustaki; *Marginal likelihood approximation and Bayes Factor in Generalized Linear Latent Variable Models*
- R. Kuijpers and M. A. L. M. van Assen; *A scaled effect size measure taking into account the distributions of the variables*
- J. Tein, H. Cham, and S. Cox; *Statistical power to detect the correct number of classes in Latent Class Analysis*
- Y. Y. Choi and D. Gi Seo; *Assessing dimensionality using different methodologies in complex assessment with dichotomous data*
- N. Gottfredson and D. J. Bauer; *Exploring the efficacy of latent class pattern mixture models for handling non-randomly missing data*
- M. Falcaro and A. Pickles; *Analysing censored longitudinal data with non-ignorable missing values*
- J. Brodbeck, A. Brown, and T. J. Croudace; *Using a Cohort-Sequential Latent Growth Model to examine alcohol use from ages 16 to 29*

LOWERCROFT SESSIONS

- (27) DIFFERENTIAL ITEM FUNCTIONING: METHODS AND APPLICATIONS. Chair: B. Clauser
- M. Wiberg; *Detecting Differential Item Functioning in licensure tests*
- Y. Su and W. Wang; *The 'DIF-free-then-DIF' strategy applied to the logistic regression procedure for DIF assessment*
- A. Kim and J. Eun Joo; *Group Differences in Strategy Use in Solving Spatial Tasks*

(25) PREFERENCE AND UNFOLDING MODELS. Chair: M. de Rooij
 R. Tsai and U. Böckenholt; *Analysis of Preference Data: Beyond Scaling*
 S. Wu and W. Wang; *The multidimensional generalized graded unfolding model*
 A. Brown and A. Maydeu-Olivares; *Improving forced-choice tests with IRT*
 N. Yang and B. Habing; *Distinguishing monotone and unfolding items when they both are present*

(39) RESPONSE TIME MODELS. Chair: M. Jansen
 J. Ranger and C. Schuster; *A model for the joint distribution of dichotomous item responses and discrete response times*
 M. Jansen; *Modelling response behavior on tests with time restrictions*
 M. Prinsloo; *Challenges in cognitive assessment*

PALMERSTON LECTURE THEATRE SESSIONS

ADVANCES IN THE ANALYSIS OF CAUSAL EFFECTS (Symposium) Organizers: Ulf Kröhne and Rolf Steyer, German Institute for International Educational Research, Chair: Ulf Kröhne
 C. Fiege and R. Steyer; *Fair Comparisons for the Evaluation of School Effects: An Application of the Theory of Causal Effects*
 S. Pohl, P. M. Steiner, J. Eisermann, R. Soellner, and T. D. Cook; *Causal unbiasedness from an observational study*
 U. Kröhne and B. Nagengast; *Generalized analysis of covariance with interactions and stochastic predictors: Unconditional inference about the average causal effect*

LATENT VARIABLE MODELS FOR COMPLEX DATA STRUCTURES (Symposium) Organizer and Chair: Frank Rijmen, Educational Testing Service
 R. Varriale, O. Lukociene, and J. K. Vermunt; *Determining the Number of Components in Multilevel Mixture (Factor) Models*
 F. Rijmen; *A Hierarchical Factor IRT Model for Items that are Clustered at Multiple Levels*
 E. H. Ip; *Analyzing Belief Items in Common Sense Models*

UPPERCROFT SESSIONS

INVITED LECTURE

Rebecca Nugent; *Finding and visualizing hierarchical cluster structure as alternative to cognitive diagnosis models*

(24) COMPUTATIONAL METHODS. Chair: Y. Takane
 S. Jung and Y. Takane; *Regularized two-stage least squares estimation for structural equation models with latent variables*
 T. Otsu; *Classifying statistically equivalent graphical models by using a logic programming language*
 T. Hsiang Lin; *Exploring factors affecting parameter estimates in mixture confirmatory factor analysis*

(20) EXPLORATORY FACTOR ANALYSIS: ROTATION. Chair: M. van del Velden
 V. Choulakian; *Some notes on Maxbet*
 K. Adachi; *Permutimin: Factor rotation to specified simple structure with least squares permutation*
 D. Gragn and N. T. Trendafilov; *Penalized varimax*

J. Lin and W. Wang; *Applying parallel analysis to full-information factor analysis for binary data*

(34) ITEM RESPONSE THEORY: INFERENCE ABOUT PROFICIENCIES. Chair: C. Schuster
 W. Lee, R. L. Brennan, and E. Lee; *Empirical evaluation of IRT ability estimators*
 C. Schuster and K. Yuan; *Robust estimation of latent ability in item response models*
 F. Samejima; *Usefulness of the conditional distribution of the true latent trait, given its MLE*
 C. Wang, H. Chang, and K. Boughton; *Some theoretical results concerning KL information in MIRT*

PLENARY ACTIVITIES

Wine Reception

Thursday, 23rd July

PRESIDENTIAL ADDRESS

Brian Junker; *Some new connections for non-parametric item response modelling*

EMERITUS LECTURE

Roderick P. McDonald; *Measuring Latent Quantities*

KEYNOTE LECTURE

Ken Koedinger; *Psychometrics and technology-enhanced education research*

INVITED LECTURE

Edoardo M. Airoldi; *Statistical models and algorithms for analysing graphs and node attributes*

BOYS SMITH SESSIONS

(13) COMPUTERIZED ADAPTIVE TESTS: APPLICATIONS. Chair: M. Brinkhuis
 N. Smits and H. Vorst; *Alternatives to CAT for a short internet administration of the SVL questionnaire*
 H. Shamir, E. Phinney Johnson, and K. Brown; *Validity and reliability of the Waterford Assessment of Core Skills*
 A. Yulianto; *Did computer simulation simulate actual performance on CAT? Comparison between real-data simulation and real CAT performance in Indonesia*
 D. Courvoisier, M. Eid, and T. Lischetzke; *Patterns of compliance to a computerized mobile phone assessment: New insights from Rasch models*

(26) DIFFERENTIAL ITEM FUNCTIONING: DETECTION. Chair: P. van Riijn
 D. Magis and P. de Boeck; *A robust statistical approach to differential item functioning*
 L. Yao and F. Li; *A DIF detection procedure in multidimensional framework and its applications*
 M. Langer; *A re-examination of Lord's Wald test for differential item functioning using item response theory and modern error estimation*
 P. de Boeck and S. Cho; *Look, can you see where there is DIF?*

(08) DYNAMIC AND LONGITUDINAL MODELS II. Chair: M. von Davier
 H. Garst; *A general longitudinal model formulated as a higher factor model*
 L. Sik-Yum, S. Xinyuan, and H. Yihing; *A two-level structural equation model approach for analyzing multivariate longitudinal responses*

- M. Browne and G. Zhang; *Capabilities of DyFA: A computer program for dynamic factor analysis*
 I. Visser and M. Speekenbrink; *DepmixS4: A framework for modelling discrete change*

CASTLEREAGH SESSIONS

(28) DIFFERENTIAL ITEM FUNCTIONING: NEW MODELS AND APPLICATIONS. Chair: R. Swartz

- R. Janssen and M. Kebede Akalu; *Modelling item order effects within a DIF framework*
 S. Frederickx, F. Tuerlinckx, P. De Boeck, and D. Magis; *An item mixture model to detect Differential Item Functioning*
 K. Schweizer; *Latent variable models representing the position effect and their application to reasoning items*

(07) GROWTH CURVES AND LONGITUDINAL MODELS II. Chair: G. Palardy

- G. J. Palardy; *A multilevel piecewise crossed random effects growth model*
 X. Song, L. Sikyum, and Hser Yihing; *Bayesian analysis of multi-variate latent curve models with non-linear longitudinal latent effects*
 S. Cagnone and S. Bianconcini; *A general multivariate latent growth model with applications in student achievements*
 S. Chow, N. Tang, Y. Yuan, X. Song, and H. Zhu; *Bayesian estimation of semi-parametric non-linear dynamic latent variable models using the Dirichlet process prior*

(44) SCALING METHODS. Chair: W. Heiser

- R. A. Faldowski, Y. Chen Wang, and G. Hong; *Solution dimensionality of principal components with optimal scaling: Adaptations and performance of simple methods*
 W. Heiser and M. J. Warrens; *Detecting positive regression dependence using the dominant axis of correspondence analysis*
 K. Okada and K. Shigemasu; *Bayesian multi-dimensional scaling for Minkowski distances*
 T. Murakami; *Multiple correspondence analysis of Likert items and explanations of non-linear relationships between person scores*

DIRAC SESSIONS

(10) COMPUTER ADAPTIVE TESTING: THE INFLUENCE OF EARLY AND PRETEST ITEMS. Chair: M. Reckase

- H. Meng, S. Steinkamp, and J. Matthews-Lopez; *A comparison study of CAT pretest item linking designs*
 M. Matteucci and B. P. Veldkamp; *Including prior information in CAT administration*
 I. Partchev; *Some new challenges in research on computerized adaptive testing*
 M. Reckase and W. He; *The influence of item pool quality on the functioning of Computerized Adaptive Tests (CATs)*

(21) EXPLORATORY FACTOR ANALYSIS: NEW DIRECTIONS. Chair: J. Van Ginkel

- S. Kao and Y. Meng Thum; *Characterizing the dimensionality of a set of random variables*
 J. van Ginkel and P. M. Kroonenberg; *Using procrustes analysis to combine the results from principal components analysis in multiple imputation*
 D. Flora and E. Romero Escobar; *Effect of minor model error on confirmatory factor analysis of ordinal variables with polychoric correlations*
 S. Unkel and N. T. Trendafilov; *Exploratory factor analysis of data matrices with more variables than observations*

(04) PSYCHOMETRIC METHODS FOR HEALTH OUTCOMES II. Chair: S. Lee

W. Emons; *On the combined use of parametric and non-parametric IRT models for polytomous items with applications to scale analysis in clinical and medical psychology*

U. Reininghaus, T. Burns, R. McCabe, S. Priebe, and T. Croudace; *Identifying differential item functioning and population heterogeneity in the measurement of patient reported outcomes in psychosis*

E. Savoca; *Accounting for Misclassification Bias in Binary Outcome Measures of Illness: The Case of Posttraumatic Stress Disorder in Male Veterans*

J. Heron, C. Joinson, G. Lewis, R. Araya, and T. Croudace; *Pubertal timing and the onset of depressive symptoms in a cohort of girls from ALSPAC*

LOWERCROFT SESSIONS

(09) COMPUTER ADAPTIVE TESTING: METHODOLOGY. Chair: S. Chen

S. Chen; *A new procedure for controlling test overlap in Computerized Adaptive Testing*

H. Shih and W. Wang; *Computerized Adaptive Testing Using the two parameter logistic model with ability-based guessing*

M. Brinkhuis and G. Maris; *Dynamic estimation*

(17) COGNITIVE DIAGNOSIS: APPLICATIONS. Chair: A. Frey

M. Hickendorff; *Estimating the accuracy of solution strategies in cognitive tasks: An explanatory IRT modelling approach*

C. Carstensen; *An application of a general diagnostic model to competency profiles from standard assessments*

Y. Tao, Y. Na, Y. Tao, and L. Lingyan; *Compilation of diagnostic math tests for grade 4 and grade 5 based on the rule space model*

G. Gonzalez Marin, S. Bouwmeester, and A. Marije Boonstra; *Understanding Planning Ability Measured by the Tower of London, a Contribution to the Construct Validity*

(29) DIFFERENTIAL ITEM FUNCTIONING: MULTILEVEL AND STRUCTURAL EQUATION APPROACHES. Chair: R. Janssen

Y. Cheong; *Detection of Differential Item Functioning in problem behavior items via hierarchical cross-classified model*

S. Jak, F. J. Oort, and C. van Zoelen; *Using SEM to detect measurement bias in dichotomous item responses: An application to the measurement of intelligence in higher education*

C. Shih and W. Wang; *Selecting DIF-free items to serve as anchors for assessment of differential item functioning: The MIMIC method*

Y. Chen, C. Shih, and W. Wang; *A scale purification procedure to MACS models for assessment of non-uniform DIF*

PALMERSTON LECTURE THEATRE SESSIONS

COMPONENT-BASED STRUCTURAL EQUATION MODELLING (Symposium) Organizer and Chair: Heungsun Hwang, McGill University

M. Tenenhaus; *A Criterion Based PLS Approach to Structural Equation Modelling*

Y. Takane; *Symbolic Computation in Generalized Structured Component Analysis*

I. R. R. Lu, R. D. Thomas, and Ernest Kwan; *The Comparison of Component- and Covariance-Based Structural Equation Modelling Approaches: Bias and Confidence Interval Coverage*

H. Hwang; *Regularized Generalized Structured Component Analysis*

MODELS AND DESIGNS FOR TESTS WITH EXPLANATORY RULES FOR THEIR ITEM DIFFICULTIES. (Symposium) Organizer and Chair: Wim van der Linden, CTB/McGraw-Hill

- W. J. van der Linden; *Introduction: Models and designs for tests with explanatory rules for their item difficulties*
- J. Hartig, C. Harsch, and J. Höler; *Explanatory Models for Item Difficulties in Reading and Listening Comprehension*
- C. A.W. Glas; *MML Estimation and Lagrange Multiplier Tests for Item-Cloning Model*
- H. Geerlings and W. J. van der Linden; *Optimal Design of Tests with Rule-Based Item Generation*
- A. Frey and N. Seitz; *Classification of Individuals using Multi-dimensional Adaptive Testing with Feedforward*

DO OUR RULERS STILL RULE? (Symposium) Organizer and Chair: Denny Borsboom, University of Amsterdam

- D. Borsboom; *Session overview*
- K. Kan, R. A. Kievit, C. V. Dolan, and H. L.J. van der Maas; *On the interpretation of the CHC Gc factor as Crystallized Intelligence*
- R. A. Kievit, J. Romeijn, L. J. Waldorp, H. S. Scholte, and D. Borsboom; *Causality, Structural Equation Modelling and Cognitive Neuroscience: Psychometric Modelling of Reductive Science*
- D. Borsboom, L. J. Waldorp, A. O.J. Cramer, H. L. J. van der Maas, and C. V. Dolan; *What if there were no latent variables? Complex systems and psychometric models*
- A. O. J. Cramer, L. J. Waldorp, H. L. J. van der Maas, and D. Borsboom; *Comorbidity: A network perspective*

UPPERCROFT SESSIONS

(06) GROWTH CURVES AND LONGITUDINAL MODELS I. Chair: M. Browne

- B. Feldman and S. Rabe-Hesketh; *Modelling growth trajectories when dropout is informative: A simulation study*
- B. Muthen and T. Asparouhov; *Modelling with non-ignorable missing data in longitudinal studies*
- A. Pickles and M. Falcaro; *Interval and non-ignorable censored observation of longitudinal cognitive data: Inferring abnormality in a context of developmental delay*
- M. von Davier, X. Xu, and C. H. Carstensen; *Measuring learning and change in a longitudinal large-scale educational assessment program with generalized latent variable models*

(45) STATISTICAL METHODOLOGY. Chair: W. Emons

- L. Canal; *Statistical analysis of interval data: Tuning up the uncertainty*
- M. Smithson; *Heterogeneity of variance distorts moderator effects*
- G. van Breukelen; *ANCOVA versus change from baseline in non-randomized studies: The true difference*
- H. Luo; *A simulation study of Fleishman's power method for generating non-normal samples*

(31) TEST EQUATING: METHODOLOGY. Chair: M. Langer

- T. Benton; *A practical criterion for choosing the most appropriate equating method in the single group design*
- K. (Chris) Han, C. S. Wells, and R. K. Hambleton; *Impact of item parameter drift on pseudo-guessing parameter estimates and test equating*
- B. Ching-Chao Wu; *Evaluating equating error for random group design with unequal sample sizes*
- P. van Rijn and A. A. Béguin; *Test equating using prior information on populations*

PLENARY ACTIVITIES

Banquet

Friday, 24th July

BOYS SMITH SESSIONS

- (11) COMPUTERIZED ADAPTIVE TESTING: ITEM SELECTION. Chair: H. hua Chang
 H. Chang, C. Wang, and K. Boughton; *A Simplified KL Information Index (SKI) for multi-dimensional computerized adaptive tests*
 M. Bakker and H. Chang; *Constrained item selection in computerized classification testing*
 C. Hsu and S. Chen; *Effects of practical constraints on item selection rules in computerized classification testing*
 R. J. Swartz and S. W. Choi; *A greedy and burdened CAT: A method to include response burden in the minimum expected posterior variance item selection method for computerized adaptive tests*

- (02) SOCIAL PSYCHOLOGY APPLICATIONS. Chair: D. Hessen
 L. Chen, M. Chen, and H. Lee; *A study on the correlation between gratitude, optimism, death attitudes, and sense of meaning in life for university students. Examples from a university in Southern Taiwan*
 L. Wang and S. Sun; *Disattenuation of correlations due to fallible measurement in meta-analysis: A critique on the debate over "voodoo" correlations in social neuroscience*
 Y. Denisova; *Response time registration via verbal reaction recording*
 Y. Dodonov; *Response time data analysis based on approximating function technique*

CASTLEREAGH SESSIONS

- (37) NON-PARAMETRIC ITEM RESPONSE THEORY. Chair: T. Bechger
 H. Straat, L. Andries van der Ark, and K. Sijtsma; *Comparing optimization algorithms for item selection in Mokken scale analysis*
 J. Tijmstra, D. J. Hessen, P. G.M. van der Heijden, and K. Sijtsma; *Testing weak item independence*
 R. Ligtoet, L. Andries van der Ark, W. P. Bergsma, and K. Sijtsma; *Polytomous latent scales for the investigation of the ordering of items*
 W. P. Zijlstra, L. Andries van der Ark, and K. Sijtsma; *Forward search applied to non-parametric IRT*

- (30) CATEGORICAL AND SURVEY DATA: METHODOLOGY. Chair: P. van der Heijden
 M. Kateri; *Phi-divergence classes of models for categorical data*
 P. van der Heijden, A. D.L. van den Hout, and U. Bockenholt; *Estimating prevalence and cheating in a double sampling scheme with direct questioning and randomized response*
 J. Ekström; *A generalized definition of the tetrachoric correlation coefficient*
 J. Verkuilen and C. Siefert; *Statistical theory of the list experiment to measure socially sensitive attitudes*

DIRAC SESSIONS

- (48) DEVELOPMENT AND ANALYSIS OF SCALES IN EDUCATION. Chair: S. Arai
 J. Lin; *The development of the 'Learning and Adaptive Stress Scale'*
 Y. Chen, Y. Cheng, K. Liu, H. Tsai, and Y. Chen; *Development of the Critical Thinking Disposition Inventory*
 S. Usami; *Statistical analysis of essay test data: Investigation of measurement problems with controlling length of essays*
 S. Arai and S. Mayekawa; *Estimation of abilities by the weighted total scores using the globally optimal scoring weights under polytomous IRT model*
- (41) DEVELOPING SCALES AND DIAGNOSES. Chair: J. Verkuilen
 K. Liu, Y. Cheng, L. Chen, and C. Hsueh; *Cut-off points for diagnosing different forms of school bullying*
 Y. Cheng, K. Liu, S. Chung, and Y. Chang; *Development of the Science Gender Stereotype Inventory and the Science Identification Inventory*
 J. Powell and A. P. Clapp; *Comparing Response Spectrum Analysis Interpretation (RSAI) of test results with Item Response Theory (IRT) and Differential Item Functioning (DIF) using the same test data*
 A. Laenen, A. Alonso, G. Molenberghs, and T. Vangeneugden; *Estimating the reliability of rating scales from clinical trial data*

LOWERCROFT SESSIONS

- (36) ITEM RESPONSE THEORY: INFERENCE ABOUT THE MODEL. Chair: M. Sano
 X. Xiong, L. Charles, and W. Mingmei; *Accuracy of estimating item parameters for the Rasch model based on small sample size*
 H. Mitsunaga and S. Mayekawa; *Item parameter calibration with non-normal ability distribution*
 M. Sano; *Detecting overestimation of discrimination parameter under surface local dependence: Real data study and effect of item deletion*
 D. Hessen; *A likelihood ratio test for special Rasch models*

PALMERSTON LECTURE THEATRE SESSIONS

- (12) COMPUTER ADAPTIVE TESTING: NEW DIRECTIONS. Chair: M. Speekenbrink
 M. Speekenbrink, N. Chater, and D. R. Shanks; *Adaptive tests for model discrimination*
 N. Seitz and A. Frey; *Multiple-category classification using multidimensional adaptive testing*
 C. Liu and W. Wang; *The application of the random-threshold generalized graded unfolding model to computerized adaptive testing and computerized classification testing*

- IDENTIFICATION PROBLEMS IN PSYCHOMETRICS (Symposium) Organizer and Chair:
 Ernesto San Martín, Pontificia Universidad Católica de Chile
 E. San Martín; *Identification problems in psychometrics: General Description of the symposium*
 J. Revuelta; *Identifiability for GLLIRM models that are more general than the NCM*
 A. Jara and E. San Martín; *Bayesian Semiparametric IRT-type Models*
 T. Bechger and G. Maris; *Equivalent Diagnostic Classification Models*
 E. San Martín, J. Rolin, and P. De Boeck; *Identification of Multiple Classification Latent Class Models (MCLCM)*

UPPERCROFT SESSIONS

- (42) GOODNESS-OF-FIT: ITEM RESPONSE THEORY AND DISCRETE DATA. Chair:
A. Maydeu-Olivares
M. Khalid and C. A. W. Glas; *Assessing model fit: A comparative study of Frequentist and Bayesian frameworks*
K. Kraus; *A new goodness-of-fit test for categorical data analysis*
D. Bock and S. Haberman; *Confidence bands for examining goodness-of-fit of estimated item response functions*
A. Maydeu-Olivares, C. García-Forero, and H. Joe; *Testing for approximate fit in IRT modelling*

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