

Patřicia Martinkov

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Current Position

Institute of Computer Science, The Czech Academy of Sciences Researcher, Vice-head of Department of Statistical Modelling	PRAGUE, CZECH REPUBLIC
Faculty of Education, Charles University Researcher	PRAGUE, CZECH REPUBLIC
University of Washington, Department of Statistics, and Center for Statistics and the Social Sciences (CSSS) Affiliate Assistant Professor	SEATTLE, U.S.A.

Education

Faculty of Mathematics and Physics, Charles University PhD degree programme in Probability and Statistics, Econometry and Financial Mathematics	PRAGUE, CZECH REPUBLIC 2003 – 2007
Dissertation: Reliability of composite dichotomous measurements Supervisor: doc. RNDr. Karel Zvra, CS.c.	
Master of Science in Probability, Mathematical Statistics and Econometry	1998 – 2003
Specialized in Statistics, Diploma thesis: Reliability of measurements Supervisor: doc. RNDr. Karel Zvra, CS.c.	

Research and Professional Experience

Institute of Computer Science, The Czech Academy of Sciences Researcher	PRAGUE, CZECH REPUBLIC Since 2008
Junior researcher	2007 – 2008
Research assistant	2001 – 2007
University of Washington, Department of Statistics, and Center for Statistics and the Social Sciences (CSSS) Visiting research scholar	SEATTLE, U.S.A. 2013 – 2015

Grants

Center for Educational Measurement and Psychometrics Principal investigator	UK PRIMUS/17/HUM/11 2018 – 2020
The relationships between skills, schooling and labor market outcomes: A longitudinal study Team member	CZECH SCIENCE FOUNDATION P402/12/G130 2017 – 2018
Estimation of Psychometric Measures as Part of Admission Test Principal investigator	CZECH SCIENCE FOUNDATION 15-15856Y 2015 – 2017
Defining and Assessing Core Principles for Undergraduate Physiology Consultant	NSF DUE-1043443 2014 – 2015
Applicants at the Doorstep Consultant	IES R305H130030 2013 – 2015
Centre of Biomedical Informatics (CBI) Team member	MŠMT 1M06014 2006 – 2011

Awards (selection)

ICS Director's Award for outstanding publication record Institute of Computer Science of the Czech Academy of Sciences	2019
Outreach Lecturing Fund Award The Council for International Exchange of Scholars (CIES)	2014
Fulbright-Masaryk Fellowship J. W. Fulbright Commission	2013
Otto Wichterle Award Czech Academy of Sciences	2011
Academic scholarship (Prospěchové stipendium) Faculty of Mathematics and Physics, Charles University	2001

Teaching – Courses (selection)

Selected topics in psychometrics (NMST570) 1/1, 3 credits	CHARLES UNIVERSITY, PRAGUE, CZECH REPUBLIC Winter, since 2017
Seminar in Psychometrics (NMST571) 0/2, 2 credits	CHARLES UNIVERSITY, PRAGUE, CZECH REPUBLIC Summer, since 2018
Item Response Theory Models of Testing (EDPSY 595) 2/1, 3 credits	UNIVERSITY OF WASHINGTON, SEATTLE, USA Winter 2015
Statistical Concepts and Methods for the Social Sciences (STAT/CSSS/SOC 221) 3/2, 5 credits	UW, SEATTLE, USA Spring 2015

Teaching – Workshops (selection)

Differential Item Functioning full-day workshop	AEA-EUROPE, LISBON, PORTUGAL November 13, 2019
Test development 3 x 2 hour workshop	RECTORATE OF THE CHARLES UNIVERSITY, PRAGUE, CZECH REPUBLIC 2018, 2019

Student Supervision

Adéla Hladká Doctoral. Statistical models in psychometrics, focusing on differential item functioning.	FACULTY OF MATHEMATICS AND PHYSICS, CHARLES UNIVERSITY Since 2016
Lubomír Štěpánek Doctoral. Modern statistical approaches for analysis of psychometric properties of tests.	1ST FACULTY OF MEDICINE, CHARLES UNIVERSITY, PRAGUE Since 2018
Dominik Tělupil Master. Computerized adaptive tests.	FACULTY OF MATHEMATICS AND PHYSICS, CHARLES UNIVERSITY 2016 – 2018
Katarína Vlčková Master. Fairness of educational tests and their items.	FACULTY OF MATHEMATICS AND PHYSICS, CHARLES UNIVERSITY 2012 – 2014

Committee member, reviewer of dissertation thesis

Martin Komarc Computerized adaptive testing in kinanthropology: Monte Carlo simulations using the physical self description questionnaire.	FACULTY OF PHYSICAL EDUCATION AND SPORT, CHARLES UNIVERSITY 2017
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Professional Activities

Psychoco 2019 - International Workshop on Psychometric Computing Local organizing committee, member of program committee Over 90 participants from more than 15 countries, 35 talks	PRAGUE, CZECH REPUBLIC 21.-22.2.2019
COST Action TD1306 <i>New Frontiers of Peer Review (PEERE)</i> Management committee member	2016 – 2018
Council for International Affairs, Czech Academy of Sciences Member , reviewer for over 20 CAS mobility projects	Since 2017
Reviewer of journal articles Science, The R Journal, Journal of Educational and Behavioral Statistics, Statistika: Statistics and Economy Journal, Psychological Medicine, Applied Psychological Measurement, The International Journal of Human Resource Management, CBE-Lifesciences, Pedagogika, Orbis Scholae, Methods of Information in Medicine.	
Book proposal reviewer Chapman Hall/CRC press.	
Conference talks/posters reviewer ECER 2016, IMPS 2017	
Czech Statistical Society	MEMBER, SINCE 2001
International Society for Clinical Biostatistics	MEMBER, SINCE 2007
Psychometric Society	MEMBER, SINCE 2016
European/Czech Association of Educational Research	MEMBER, SINCE 2016

Publications

WOS: 35 publications, 218 citations, h-index 7 (see E-5090-2014 on researcherid.com)

Articles in print and under review (selection)

Martinková, P., Hladká, A., & Potužníková, E. (2020) Is academic tracking related to gains in learning competence? Using propensity score matching and differential item change functioning analysis for better understanding of tracking implications. *Learning and Instruction*. In print.

Bartoš, F., **Martinková, P.**, & Brabec, M. (2020) Testing heterogeneity in inter-rater reliability. In Wiberg, M., et al. (Eds.) *Quantitative Psychology: The 84th Annual Meeting of the Psychometric Society*, Santiago, Chile, 2019. New York: Springer. In Print.

Articles in international impacted journals (selection)

Martinková, P. & Drabinová, A. (2018) ShinyItemAnalysis for teaching psychometrics and to enforce routine analysis of educational tests. *The R Journal*, 10(2), 503-515.

Martinková, P., Goldhaber, D., & Erosheva, E. (2018) Disparities in ratings of internal and external applicants: A case for model-based inter-rater reliability. *PLoS ONE* 13(10): e0203002.

Martinková, P., Freeman, J., Drabinová, A., Erosheva, E., ..., Řasová, K. (2018) Physiotherapeutic interventions in multiple sclerosis across Europe: Regions and other factors that matter. *Multiple Sclerosis and Related Disorders*, 22, 59–67.

Martinková, P., Drabinová, A., Liaw, Y. L., Sanders E. A., McFarland, J. L., & Price, R. M. (2017) Checking equity: Why DIF analysis should be a routine part of developing conceptual assessments. *CBE-Life Sciences Education*, 16(2), rm2.

McFarland, J.L., Price, R.M., Wenderoth, M.P., **Martinková, P.**, Cliff, W., Michael, J., Modell, H., & Wright, A. (2017). Development and Validation of the Homeostasis Concept Inventory. *CBE-Life Sciences Education*, 16(2), ar35.

Michael, J., **Martinková, P.**, McFarland, J.L., Wright, A., Cliff, W., Modell, H., Wenderoth, M.P. (2017). Validating a conceptual framework for the core concept of "cell-cell communications". *Advances in Physiology Education*, Vol. 41 no. 2, 260-265.

Drabinová, A., & **Martinková, P.** (2017) Detection of differential item functioning with non-linear regression: Non-IRT approach accounting for guessing. *Journal of Educational Measurement*, 54(4), 498-517.

Řasová, K., Freeman, J., **Martinková, P.** et al. (2016). The Organisation of Physical Therapy for People with Multiple Sclerosis across Europe: A Multicentre Questionnaire Survey. *BMC Health Serv Res*, 16, 552.

Řasová, K., **Martinková, P.**, Vyskotová, J., Šedová, M. (2012) Assessment set for evaluation of clinical outcomes in multiple sclerosis - psychometric properties. *Patient Related Outcome Measures*, 3, 59-70.

Štuka, Č., **Martinková, P.**, Zvára, K., Zvárová, J. (2012) The prediction and probability for successful completion in medical study based on admission test and pre-admission grades. *The New Educational Review*, 28(2), 138-152.

Ibrahim, I., Tintěra, J., Škoch, A., Jírů, F., Hlušík, P., **Martinková, P.**, Zvára, K., Řasová, K. (2011) Fractional anisotropy and mean diffusivity in the corpus callosum of patients with multiple sclerosis: the effect of physiotherapy. *Neuroradiology*, 53(11), 917-26.

Martinková, P., Zvára, K. (2007) Reliability in the Rasch Model. *Kybernetika*, 43(3), 315-26.

Martinková, P., Zvára jr., K., Zvárová, J., Zvára, K. (2006) The New Features of the Exam Evaluation System and Reliability of Its Fixed Tests. *Methods of Information in Medicine*, 45(2), 310-315.

Řasová, K., Havrdová, E., Brandejský, P., Zálišová, M., Foubíková, B., **Martinková, P.** (2006) Comparison of the Influence of Different Rehabilitation Programmes on Clinical, Spirometric and Spiroergometric Parameters in Patients with Multiple Sclerosis. *Multiple Sclerosis Journal*, 12(2), 227-234.

Řasová, K., Krásenský, J., Havrdová, E., Obenberger, J., Seidel, Z., Doležal, O., **Rexová, P.**, Zálišová, M. (2005). Is it Possible to Actively and Purposely make use of Plasticity and Adaptability in the Neurorehabilitation Treatment of Multiple Sclerosis Patients? A Pilot Project. *Clinical Rehabilitation*, 19(2), 170-181.

Řasová, K., Brandejský, P., Havrdová, E., Zálišová, M., **Rexová, P.** (2005) Spiroergometric and spirometric parameters in patients with multiple sclerosis: are there any links between these parameters and fatigue, depression, neurological impairment. *Multiple Sclerosis Journal* 11 (2), 213-221.

Vášková, M., Mejstříková, E., Kalina, T., **Martinková, P.**, Omelka, M., Trka, J., Starý, J., Hrušák, O. (2005) Transfer of Genomics Information to Flow Cytometry: Expression of CD27 and CD44 Discriminates Subtypes of Acute Lymphoblastic Leukemia. *Leukemia*, 19(5), 876-878.

Peer-reviewed articles in Czech journals (selection)

Martinková, P., Drabinová, A., & Houdek, J. (2017) ShinyItemAnalysis: Analýza přijímacích a jiných znalostních či psychologických testů. *TESTFÓRUM*, 6(9), 16-35.

Martinková, P., Vlčková, K. Hodnocení reliability znalostních a psychologických testů. *Bulletin České statistické společnosti*, 25(4), 1-15.

Monographs

Štuka, Č., **Martinková, P.**, Vejražka, M., Trnka, J., Komenda, M. (2013). *Testování znalostí při výuce medicíny. Konstrukce a analýza testů na lékařských fakultách*. 156 stran. Praha: Karolinum. ISBN 9788024623696.

Software

Martinková, P., Hladká, A. (2020) ShinyItemAnalysis: Test and item analysis via shiny. R package version 1.3.2, over 21.000 downloads from CRAN, more than 15.000 online visits from more than 100 countries, over 1.000 monthly average downloads from GitHub

Hladká, A., **Martinková, P.** (2020) difNLR: DIF and DDF detection by non-linear regression models. R package version 1.3.2

Invited talks and seminars (selection)

Deeper analysis of group disparities in ratings motivated by simulated and real data examples. CSSS 20th Anniversary Conference, University of Washington, Seattle. May 24, 2019.

Assessing disparities in student and applicant ratings. Seminar in Applied Mathematics. Masaryk University, Brno, May 14, 2019.

Advanced analysis of educational measurement. Seminar of Department of Didactics of Mathematics. Faculty of Mathematics and Physics, Charles University, May 2, 2019.

ShinyItemAnalysis for psychometric training and to enforce routine analysis of educational tests. R meetup Warsaw, May 24, 2018.

Towards effective and equitable assessment with ShinyItemAnalysis. 4EU Flagship workshop, Charles University, Prague, September 2018.

Statistika pro interdisciplinární výzkum. General membership meeting of the Czech statistical society, Prague, January, 2016

Assessment of clinical outcomes in multiple sclerosis: Challenges for international comparative studies. Workshop, Praha, Česká republika, 2016.

Researching reliability estimates in the context of Czech admission tests. OLF travel award, presented at UC Merced, UC Berkeley, and UCLA, 2014.

Conference talks (selection)

- Martinková, P.**, Drabinová A. Simulated and Real Data Examples for Teaching Psychometrics. Psychoco 2019. International workshop on psychometric computing, 21-22 February, Prague.
- Martinková, P.**, Goldhaber D, Erosheva E. Model-Based Reliability to Check for Disparities in Ratings of Internal and External Applicants. EAM 2018, 25-27 July, Jena.
- Martinková, P.**, Drabinová A. ShinyItemAnalysis for psychometric training and research. IMPS 2018, July, New York.
- Martinková, P.**, Goldhaber D, Erosheva E, Lee C. Improving the Peer-Review Process with Model-Based Estimates of Inter-Rater Reliability and Detection of Rating Bias: From Teacher Selection to Journal Submissions and Grant Applications. PEERE International Conference on Peer Review, March 2018, Rome.
- Martinková, P.**, Drabinová A, Houdek J, Leder O, Štěpánek L. Teaching Psychometrics and Analyzing Educational Tests with ShinyItemAnalysis. useR!2017, Brussels.
- Martinková, P.**, Drabinová A. Detection of DIF Based on Non-IRT Generalized Regression Approaches. IMPS 2017, Zurich.
- Martinková, P.**, Drabinová A, Houdek J. Interactive and Step by Step Analyses of Test and Item Properties with "difNLR" and "ShinyItemAnalysis". Psychoco – International Workshop on Psychometric Computing 2017, Vienna.
- Martinková, P.**, Drabinová A, Leder O. Detection of Differential Item Functioning with difNLR Function. useR! 2016, Stanford University.
- Martinková, P.**, Goldhaber D. Mixed-Effect Models for Assessing Interrater Reliability and Its Moderators. IMPS 2016, Asheville.
- Drabinová A, Martinková P. Detection of Differential Item Functioning Based on Non-Linear Regression. IMPS 2016, Asheville. Student travel award for A. Drabinová.
- Martinková, P.**, Goldhaber D. Hierarchical Models for Assessing Reliability in Teacher Hiring. JSM, Seattle, Aug 2015.
- Martinková, P.**, Goldhaber D. Improving Teacher Selection: Effect of Inter-rater and Intra-rater Reliability in Screening Process. AAFP, Washington D.C., Feb 2015.
- Martinková, P.**, Turčíčová M. Generalized Reliability Used for the Comparison of Reliability Estimates in Tests with Binary Items. Presented at IMPS 2013, Arnhem, Netherlands. Best poster award.
- Řasová K, **Martinková, P.**, Henze, T. Towards an Inventory of the Content of Physical Rehabilitation in Europe. Lifelong Perspective: Rehabilitation for MS Patients with Complex Needs, University of Turku, 24, 2011. Presented at RIMS 2011, Turku, Finland.
- Martinková, P.**, Šedová M, Řasová K. Reliability of clinical functioning measures in patients with multiple sclerosis. 30th Annual Conference of the International Society for Clinical Biostatistics, 147, 2009. Presented at ISCB 2009, Prague, Czech Republic.
- Martinková, P.**, Zvára K. Reliability of Composite Dichotomous Measurements. 29th Annual Conference of the International Society for Clinical Biostatistics, 93, 2008. Presented at ISCB 2008, Copenhagen, Denmark.