Course Description: Growth Modelling

1.5 cp, doctoral level

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Course leader	Claudia Bernhard Oettel	Phone: 08-163886 Email: cbl@psychology.su.se
Teachers	Yannick Griep, University of Calgary	Email: yannick.griep@ucalgary.ca
	Tim Vantilborgh, Vrije Universiteit Brussel	Email: tim.vantilborgh@vub.ac.be
Course administrator	Norah Shagir	Phone: 08-163864 Email: norah.shagir@psychology.su.se
Examinator	Claudia Bernhard Oettel	Phone: 08-163886 Email: cbl@psychology.su.se

Language: English

Course level: Doctoral level

Eligibility criteria: Accepted for studies at doctoral level within social sciences including public health

Main field of study: Psychology

Host department: Department of Psychology, Stockholm University

Sign up: via email to SSC graduate school coordinator Lena Låstad lena.lastad@psychology.su.se Note that the number of participants will be limited and registration is on a first-come, first-served basis.

Growth Modelling

Course Content

The course is given as 1.5 credit point module including theoretical aspects and practical applications of growth modelling using the statistical programs R and Mplus. The overall aim of the course is for students at doctoral level to develop their theoretical knowledge and practical skills in random coefficient, latent growth curve, and latent class modelling. Students shall be able to identify when to use each method, critically reflect upon advantages and disadvantages, and identify important differences between the techniques of growth modelling. Finally, students shall be capable of employing the methods within R and Mplus in their own research.

The first part of the course focuses on Random Coefficient Modelling (RCM) and gives a general overview of the theoretical background and when RCM is applicable to use. Practical exercises are performed in R with a step-by-step example. Differences and similarities with latent growth modelling and latent class growth modelling are discussed as well as limitations of RCM. Students work on exercises in pairs and individually.

The second part of the course focuses on latent growth modelling (LGM). A theoretical background of LGM, when to use LGM, and a brief introduction to Mplus are provided. A step-by-step example on how to model latent growth curves in Mplus is presented. Differences and similarities with RCM and latent class growth modelling are discussed as well as limitations of LGM. Exercises are given to be solved in pairs and individually.

In the third part of the course latent class growth modelling (LCGM) is discussed with a theoretical introduction and practical examples. An example is presented how to perform LCGM in Mplus. Limitations of LCGM and differences and similarities with RCM and LGM are discussed. Again, students work on exercises in pairs and individually.

Expected learning outcomes

Having finalized the course, students will be able to:

1) Understand theoretical background of Random Coefficient Modelling (RCM), Latent Growth Modelling (LGM) and Latent Class Growth Modelling (LCGM)
2) Critically reflect on strengths and limitations of the methods and their differences and similarities
3) Differentiate between when which method is applicable and choose appropriate method in own data
4) Perform RCM, LGM and LCGM in statistical packages R or Mplus
5) Present and discuss results and valid conclusions from the analyses of examples and own data

Instruction

The course is given over the course of three days with each first half of the day focusing on developing theoretical knowledge and showcasing a practical example via lectures, while during the second half of the day students work on exercises using the statistical computer programs R or Mplus in pairs and individually.

Learning environment

Lectures, computer-based exercises individually and in pairs. Students bring their own computers with R and a full Mplus license installed (the Mplus demo version is NOT sufficient!).

Examination

Individual computer-based examination that will be conducted and handed in after the course days (exact date will be announced prior to the course). The examination will consist of exercises similar to the ones carried out during class.

Grade and grade criteria

The course is graded on a pass/fail basis:
Pass: For a passing grade, the doctoral student has completed the individual computer-based examination and thereby shown that the expected learning outcomes are achieved.
Fail: The examination task has been solved insufficiently, in such a way that the expected learning outcomes are not met.

Course literature

Bliese, P. D., & Ployhart, R. E. (2002). Growth Modeling Using Random Coefficient Models: Model Building, Testing, and Illustrations. *Organizational Research Methods, 5*(4), 362–387. doi:10.1177/109442802237116 (26 pages)

Bidee, J., Vantilborgh, T., Pepermans, R., Griep, Y., & Hofmans, J. (2016). Temporal dynamics of need satisfaction and need frustration. Two sides of the same coin? *European Journal of Work and Organizational Psychology,* 0643(May), 1–14. doi:10.1080/1359432X.2016.1176021 (14 pages)

Byrne, B. (2011). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routledge. (179 pages)

Duncan, T. E., & Duncan, S. C. (2004). An introduction to latent growth curve modeling. *Behavior Therapy, 35*(2), 333–363. doi:10.1016/S0005-7894(04)80042-X (31 pages)

Field, A., Miles, J., & Field, Z. (2012). *Discovering statistics using R*. London: Sage.

Jung, T., & Wickrama, K. a. S. (2008). An Introduction to Latent Class Growth Analysis and Growth Mixture Modeling. *Social and Personality Psychology Compass*, 2(1), 302–317. doi:10.1111/j.1751-9004.2007.00054.x (16 pages)

Morin, A., & Nagengast, B. (2011). General growth mixture analysis of adolescents' developmental trajectories of anxiety: the impact of untested invariance assumptions on substantive interpretations. *Structural Equation Modeling, 18*:613–648. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/10705511.2011.607714 (36 pages)

Nylund, K. L., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling : A monte carlo simulation study. *Structural Equation Modeling, 14*(4), 535–569. (35 pages)

Preacher, K., Wichman, A., MacCallum, R., & Briggs, N. (2008). Latent growth curve modeling (pp. 1–21). Retrieved from http://www.corwin.com/upm-data/23140_Chapter_1.pdf