A gentle introduction to Bayesian Statistics (Course code S18)
23.8.2021-27.8.2021 (week 34)

Course Director: *Prof.* dr. *Rens van de Schoot*
Lecturers: Rens vd Schoot, Katharina Meitinger, Rebecca Kuiper, Beth Grandfield, Ingrid Arts
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Saturday and Sunday (24 & 25 August)		
Time	**Activity**	**Description**
12.00-18.00	*Key pick up*	*You will find the exact key pick up location in the pre-departure information, which becomes available after you have paid the course fee.*

Day	**Time**	**Type**	**Description**
Monday	09:00 -12:45	*Lecture by Rens van de Schoot* *The chat in Teams, for people attending online, will be moderated by Beth Grandfield*	Conceptual introduction + reasons for using Bayesian methods + discussion on interpretability of results when using p-values/95%intervals + empirical example of a linear regression analysis in the Bayesian framework. Useful reference: *van de Schoot, R., Depaoli, S., King, R. et al. Bayesian statistics and modelling. Nature Review Methods Primers 1, 1 (2021). https://doi.org/10.1038/s43586-020-00001-2*
	12:45 -13.30	*Lunch*	
	13:30 -15.00	*Computer lab*	Work on exercises and ask questions via the chat to Beth Grandfield and Rens van de Schoot
	15.00 – 16.00	*Q&A by Rens van de Schoot*	Ask your questions about the exercises. (since there will be extensive answers provided we will not show how to perform the exercises, but we will answer all you conceptual questions)

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Tuesday	09:00 -12:45	*Lecture by Rens van de Schoot* *The chat in Teams, for people attending online, will be moderated by Beth Grandfield*	Q&A + WAMBS-checklist (when to worry and how to avoid the misuse of Bayesian Statistics) Useful references: *Depaoli, S., & Van de Schoot, R. (2017). Improving transparency and replication in Bayesian statistics: The WAMBS-Checklist. Psychological methods, 22(2), 240.* *Van de Schoot, R., Veen, D., Smeets, L., Winter, S. D., & Depaoli, S. (2020). A tutorial on using the WAMBS checklist to avoid the misuse of Bayesian statistics. Small Sample Size Solutions: A Guide for Applied Researchers and Practitioners; van de Schoot, R., Miocevic, M., Eds, 30-*
	12:45 -13.30	*Lunch*	
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Wednesday	09:00 -12:45	*Lecture by Katherina Meitinger* *The chat in Teams, for people attending online, will be moderated by Ingrid Arts*	Bayesian CFA, testing for Measurement Invariance and approximate MI. Useful references: *Davidov, E., Meuleman, B., Cieciuch, J., Schmidt, P., & Billiet, J. (2014). Measurement equivalence in crossnational research. Annual Review of Sociology, 40, 55– 75.* *Van De Schoot, R., Kluytmans, A., Tummers, L., Lugtig, P., Hox, J., & Muthén, B. (2013). Facing off with Scylla and Charybdis: a comparison of scalar, partial, and the novel possibility of approximate measurement invariance. Frontiers in psychology, 4, 770.* *Muthén, B., and Asparouhov, T. (2012b). Bayesian SEM: a more flexible representation of substantive theory. Psychol. Methods 17, 313–335. doi: 10.1037/a0026802*
	12:45 -13.30	*Lunch*	
	13:30 -15:00	*Computer lab*	Work on exercises and ask questions via the chat to Ingrid Arts and Katherina Meitinger
	15.00 – 16.00	*Q&A by Katherina Meitinger*	Ask your questions about the exercises. (since there will be extensive answers provided we will not show how to perform the exercises, but we will answer all you conceptual questions)

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Thursday	09:00 -17.00	*Lecture by Rebecca Kuiper* *The chat in Teams, for people attending online, will be moderated by Beth Grandfield*	Introduction to informative hypotheses, Bayesian model selection (BMS), and model selection using information criteria (i.e., AIC and its generalization called the GORIC). This includes interpretating Bayes factors, posterior model probabilities, and GORIC weights. Useful references: *Hoijtink, H. (2012). Informative Hypotheses. Theory and Practice for Behavioral and Social Scientists. Boca Raton: Chapman and Hall/CRC.* *Kuiper, R.M., Hoijtink, H.J.A. & Silvapulle, M. J. (2011). An Akaike-type information criterion for model selection under inequality constraints. Biometrika, 98, pp. 495-501.*
	12:45 -13.30	*Lunch*	
	13:30 -15:00	*Computer lab*	Work on exercises and ask questions via the chat to Beth Grandfield and Rebecca Kuiper.
	15.00 – 16.00	*Q&A by Rebecca Kuiper*	Ask your questions about the exercises. (since there will be extensive answers provided we will not show how to perform the exercises, but we will answer all you conceptual questions)

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Friday	09:00 -12.45	*Lecture by Rebecca Kuiper* *The chat in Teams, for people attending online, will be moderated by Beth Grandfield*	Updating a hypothesis and combining evidence from multiple studies. Notably, the evaluation of informative hypotheses using model selection, discussed on Day 4, plays an important role here. Useful reference: *Kuiper, R.M., Buskens, V.W., Raub, W. & Hoijtink, H. (2013). Combining statistical evidence from several studies: A method using Bayesian updating and an example from research on trust problems in social and economic exchange. Sociological Methods and Research, 42 (1), pp. 60-81.*
	12:45 -13.30	*Lunch*	
	13:30 -15:00	*Computer lab*	Work on exercises and ask questions via the chat to Beth Grandfield and Rebecca Kuiper.
	15.00 – 16.00	*Q&A by Rebecca Kuiper*	Ask your questions about the exercises. (since there will be extensive answers provided we will not show how to perform the exercises, but we will answer all you conceptual questions)

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