

# SONJA D. WINTER

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## EXPERIENCE

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### Missouri Prevention Science Institute, University of Missouri

*Postdoctoral Fellow*

August 2021 - current

*Columbia, Missouri*

I am currently a methodological postdoctoral fellow working under the mentorship of Dr. Wes Bonifay. I broadly focus on Bayesian methods and structural equation models.

### Winter Statistics

*Consultant*

January 2014 - June 2016

*Amsterdam, the Netherlands*

I provided statistical consultancy and support with executing research and analyses. Clients included: VU (University) Amsterdam, Elastic (USA), Lund University (Sweden), Rutgers Foundation.

### Utrecht University

*Researcher*

January 2014 - June 2016

*Utrecht, the Netherlands*

I worked for Dr. Rens van de Schoot, at the department of Methodology and Statistics for the Behavioral and Social Sciences. My responsibilities included providing support at each step of the research cycle; Organizing meetings and conferences; Communication with guests and speakers; Putting forth new ideas for future research.

## EDUCATION

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### University of California, Merced

2016-2021

Ph.D., Psychological Sciences

Area of Study: Quantitative Methods, Measurement, and Statistics

Advisor: [Associate Professor Sarah Depaoli](#)

Dissertation: *Advanced Methods for Detecting Specification Issues in Bayesian Structural Equation Modeling.*

### Utrecht University, the Netherlands

2011-2013

M.Sc. (Cum Laude), Psychology

Area of Study: Developmental Psychology

Advisor: [Professor Jan Boom](#)

Thesis: *What matters? The role of cognitive competence and affective beliefs in educational achievement during adolescence.*

### Utrecht University, the Netherlands

2008-2011

B.Sc. (with honours), Psychology

Area of Study: Developmental Psychology

Advisor: [Professor Geertjan Overbeek](#)

Thesis: *Differential susceptibility? Interaction of the DRD4-7R polymorphism and parenting practices on aggressive and prosocial behaviour.*

## FELLOWSHIPS & AWARDS

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### Society of Multivariate Experimental Psychology (SMEP)

Dissertation Research Award 2021

### University of California, Merced

Will Shadish Graduate Student Fellowship (competitive campus-wide fellowship for research and teaching excellence) 2020

Psychological Sciences Outstanding Graduate Student 2020-2021

Psychological Sciences Research Support Award 2020

Psychological Sciences William R. Shadish Award for Leadership and Service 2019-2020

Psychological Sciences Research Dissemination Award 2018-2021

Psychological Sciences Jennifer Mendiola Travel Award 2018

Psychological Sciences Summer Support Fellowship 2017-2021

Psychological Sciences Graduate Group Recruitment Fellowship 2016

Graduate Student Association Travel Award 2018

### Journals

Article of the Year Award: [Communication Methods and Measures Journal](#), for: 2015  
*Possible solution to publication bias through bayesian statistics, including proper null hypothesis testing.*

## GRANTS

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### In Preparation

1. National Science Foundation: *Understanding the Role of Priors in Bayesian Model Evaluation: Development of User-Friendly Tools*. Role: Principal Investigator.

### Previously Submitted

1. Institute of Education Sciences: *Development of User-Friendly Tools for Ensuring Appropriate Priors in Bayesian Data Analysis* (Not Funded). Role: Principal Investigator. Total Requested: \$622,956. [Overall Score: 2.27]

## PUBLICATIONS

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### Peer-Reviewed Articles

1. **Winter, S. D.**, & Depaoli, S. (2022). Detecting Prior-Data Disagreement in Bayesian Structural Equation Modeling. *Structural Equation Modeling: A Multidisciplinary Journal*. doi:[10.1080/10705511.2022.2039066](#)
2. **Winter, S. D.**, & Depaoli, S. (2022). Sensitivity of Bayesian Model Fit Indices to the Prior Specification of Latent Growth Models. *Structural Equation Modeling: A Multidisciplinary Journal* 29(5), 667-686. doi:[10.1080/10705511.2022.2032078](#)
3. **Winter, S. D.**, & Depaoli, S. (2022). Performance of Model Fit and Selection Indices for Bayesian Structural Equation Modeling with Missing Data. *Structural Equation Modeling: A Multidisciplinary Journal*, 29(4), 531-549. doi:[10.1080/10705511.2021.2018656](#)

4. van de Schoot, R., **Winter, S. D.**, Griffioen, E., Grimmelikhuijsen, S., Arts, I., Veen, D., Grandfield, E. M., & Tummers, L. G. (2021). The Use of Questionable Research Practices to Survive in Academia: Expert Elicitation, Prior-Data Conflicts, Bayes Factors for Replication Effects, and the Bayes Truth Serum. *Frontiers in Psychology: Quantitative Psychology & Measurement*, 12, 621547 doi:10.3389/fpsyg.2021.621547
5. Arroyo, A. C., **Winter, S. D.**, Depaoli, S., & Zawadzki, M. J. (2021). Illuminating Differences in The Psychological Predictors of Academic Performance for First- And Continuing-Generation Students. *Journal of Educational and Psychological Research*, 3(2), 234-246.
6. Depaoli, S., **Winter, S. D.**, & Visser, M. (2020). The Importance of Prior Sensitivity Analysis in Bayesian Statistics: Demonstrations using an Interactive Shiny App. *Frontiers in Psychology: Quantitative Psychology & Measurement*, 11, 3271. doi:10.3389/fpsyg.2020.608045
7. Smid, S. C., & **Winter, S. D.** (2020). Dangers of the Defaults: A Tutorial on the Impact of Default Priors when using Bayesian SEM with Small Samples. *Frontiers in Psychology: Quantitative Psychology & Measurement*, 11, 611963. doi:10.3389/fpsyg.2020.611963
8. **Winter, S. D.**, & Depaoli, S. (2020). An Illustration of Bayesian Approximate Measurement Invariance with Longitudinal Data and a Small Sample Size. *International Journal of Behavioral Development*, 44(4), 371-382. doi:10.1177/0165025419880610
9. Depaoli, S., **Winter, S. D.**, Lai, K., & Guerra-Peña, K. (2019). Implementing continuous non-normal skewed distributions in latent growth mixture modeling: An assessment of specification errors and class enumeration. *Multivariate Behavioral Research*, 54(6), 795-821. doi:10.1080/00273171.2019.1593813
10. Hoorn, J. F., & **Winter, S. D.** (2018). Here comes the bad news: Doctor robot taking over. *International Journal of Social Robotics*, 10, 519-535. doi:10.1007/s12369-017-0455-2
11. Tiemensma, J., Depaoli, S., **Winter, S. D.**, Felt, J. M., Rus, H., & Arroyo, A. C. (2018). The Performance of the IES-R for Latinos and non-Latinos: Assessing Measurement Invariance. *PLoS ONE*, 13(4), e0195229. doi:10.1371/journal.pone.0195229
12. van de Schoot, R., Sijbrandij, M., Depaoli, S., **Winter, S. D.**, & van Loey, N. (2018). Bayesian PTSD-Trajectory Analysis with Informed Priors Based on a Systematic Literature Search and Expert Elicitation. *Multivariate Behavioral Research*, 53(2), 267-291. doi:10.1080/00273171.2017.1412293
13. **Winter, S. D.**, Depaoli, S., & Tiemensma, J. (2018). Assessing differences in how the CushingQoL is interpreted across countries: Comparing patients from the U.S. and the Netherlands. *Frontiers in Endocrinology*, 9, 368. doi:10.3389/fendo.2018.00368
14. van de Schoot, R., Sijbrandij, M., **Winter, S. D.**, Depaoli, S., & Vermunt, J. K. (2017). The GRoLTS-Checklist: Guidelines for reporting on latent trajectory studies. *Structural Equation Modeling: A Multidisciplinary Journal*, 24(3), 451-467. doi:10.1080/10705511.2016.1247646
15. van de Schoot, R., **Winter, S. D.**, Ryan, O., Zondervan-Zwijnenburg, M. & Depaoli, S. (2017). A systematic review of Bayesian articles in psychology: The last 25 years. *Psychological Methods*, 22(2), 217-239. doi:10.1037/met0000100
16. Konijn, E. A., van der Schoot, R., **Winter, S. D.**, & Ferguson, C. J. (2015). Possible solution to publication bias through Bayesian statistics, including proper null hypothesis testing. *Communication Methods and Measures*, 9(4), 280-302. doi:10.1080/19312458.2015.1096332

## Book Chapters

1. Depaoli, S., Kaplan, D., & **Winter, S. D.** (in press). Foundations and extensions in Bayesian structural equation modeling. In Hoyle, R. (2nd Ed.) *Handbook of structural equation modeling*. New York, NY: The Guilford Press. [final manuscript accepted September 1, 2021]
2. van de Schoot, R., Griffioen, E., & **Winter, S. D.** (2021). Dealing with imperfect elicitation results. In Hanea, A.M., Nane, G.F., Bedford, T., French, S. (Eds.), *Expert Judgment in Risk and Decision Analysis*. Basel: Springer International Publishing.
3. 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. In R. van de Schoot & M. Miočević (Eds.), *Small Sample Size Solutions: A guide for applied researchers and practitioners* (pp. 30–49). London: Routledge. doi:10.4324/9780429273872-4

## Software

1. Falk, C.F. & Muthukrishna, M. (2020). ockhamSEM: Tools for studying fit propensity in structural equation modeling. Available from: [github.com/falkcarl/ockhamSEM.git](https://github.com/falkcarl/ockhamSEM.git). **Winter, S. D.** [contributor]: table and graph output functions for fitting propensity results (to be included in October 2022 update).
2. Depaoli, S., **Winter, S. D.**, & Visser, M. (2020). The Importance of Prior Sensitivity Analysis in Bayesian Statistics: Demonstrations using an Interactive Shiny App. [ucmquantpsych.shinyapps.io/sensitivityanalysis](https://ucmquantpsych.shinyapps.io/sensitivityanalysis).
3. Smid, S.C., & **Winter, S. D.** (2020). Shiny App: The Impact of Prior Distributions in a Bayesian Latent Growth Model. [utrecht-university.shinyapps.io/impact\\_of\\_prior\\_distributions](https://utrecht-university.shinyapps.io/impact_of_prior_distributions).
4. Behrens, L., **Winter, S. D.**, & van de Schoot, R. (2018). Shiny App: FBI: First Bayesian Inference. [utrecht-university.shinyapps.io/bayesian\\_estimation](https://utrecht-university.shinyapps.io/bayesian_estimation).

## PAPERS UNDER REVIEW

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1. **Winter, S. D.**, & Depaoli, S. (revise & resubmit). Illustrating the Value of Prior Predictive Checking for Bayesian Structural Equation Modeling. Submitted on September 15, 2022 to *Structural Equation Modeling: A Multidisciplinary Journal*.

## PAPERS IN PREPARATION

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1. **Winter, S. D.**, Bonifay, W., & Watts, A. (in preparation). Prior Specification in Bayesian Estimation Affects a Model's Fitting Propensity. [Analyses completed, first draft written.]
2. Bonifay W., **Winter, S. D.**, Skoblow, H., & Watts, A. (in preparation). Good fit is not a Sufficient Indicator of Replication Success. [Invited contribution to special issue of *Assessment* on "Assessment, Measurement, and Registered Replication."]
3. Merkle, E., Ariyo, O., Garnier-Villarreal, M., & **Winter, S. D.** (in preparation). Opaque Prior Distributions in Bayesian SEM. [First draft written.]
4. Depaoli, S., Liu, H., & **Winter, S. D.** (in preparation). The Impact of Underfitting and Overfitting on the Performance of Bayesian Fit Indices in SEM [Analyses completed, writing first draft.]
5. **Winter, S. D.** & Wiedermann, W. (in preparation). A Bayesian Approach to Direction Dependence Analysis. [Analyses in progress.]
6. **Winter, S. D.**, Sinval, J., & Merkle, E. (in preparation). Comparing priors for estimating sparse ordinal indicators in Bayesian factor analyses. [Developed working code.]

## PRESENTATIONS

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\* denotes presenter

### Conference Presentations

1. Bonifay W.\*, **Winter, S. D.**, & Watts, A. (2023, January). *Better than good fit: Methods for more insightful measurement model evaluations*. Talk to be presented at the Hawaii International Conference on Education (HICE), Honolulu, Hawaii.
2. **Winter, S. D.\***, Bonifay, W., & Watts, A. (2022, July). *Bayesian prior specification and model fitting propensity*. Talk presented at the International Meeting of the Psychometric Society (IMPS), Bologna, Italy.
3. McCall, C\* & **Winter, S. D.\*** (2022, July). *Using intersectional research methods to examine intervention efficacy*. Roundtable Discussion presented at the Annual Conference of the International School Psychology Association (ISPA), Leuven, Belgium.
4. **Winter, S. D.\*** & Depaoli, S. (2022, April). *Detecting Misspecification in Latent Growth Models with Bayesian Fit Indices*. E-board presented at the National Council on Measurement and Education (NCME) Conference, San Diego, CA.
5. **Winter, S. D.\*** & Depaoli, S. (2021, July). *Detecting Misspecification in Latent Growth Models with Bayesian Fit Indices*. Talk presented at the International Meeting of the Psychometric Society (IMPS).
6. **Winter, S. D.\*** & Depaoli, S. (2021, May). *Classification and Estimation Accuracy of Growth Mixture Models with Class-Predicting Covariates: Frequentist and Bayesian Approaches*. Poster presented at the APS Virtual Convention.
7. Arroyo, A. C.\*, **Winter, S. D.**, Depaoli S., & Zawadski, M. (2019, May). *Psychosocial Traits and Academic Performance: First- and Continuing-generation College Students*. Poster presented at the 31st APS Annual Convention, Washington, DC.
8. Smid, S. D.\* & **Winter, S. D.** (2019, May). The Impact of Default Priors in Bayesian SEM with Small Samples. In R. van de Schoot (chair) *Risks of Default Priors in Bayesian Structural Equation Models with Small Samples and Two Approaches on How to Avoid Those Risks*. Talk presented at the 31st APS Annual Convention, Washington, DC.
9. **Winter, S. D.\*** & Smid, S. (2019, May). Demonstration of an Online Educational Application on Bayesian Default Priors. In R. van de Schoot (chair) *Risks of Default Priors in Bayesian Structural Equation Models with Small Samples and Two Approaches on How to Avoid Those Risks*. Talk presented at the 31st APS Annual Convention, Washington, DC.
10. **Winter, S. D.\*** & Lek, K. M. (2018, July). *Bayesian Approximate Measurement Invariance: For Those Times When You Have Too Little or Too Much Data*. Talk presented at VIII European Congress of Methodology, Jena, Germany.
11. **Winter, S. D.\*** & Depaoli S. (2018, May). *Measurement Invariance for Second-Order Latent Growth Models: Frequentist and Bayesian Approaches*. Poster presented at the 30th APS Annual Convention, San Francisco, CA.
12. **Winter, S. D.\*** & Depaoli S. (2017, March). *Bayesian Approximate Measurement Invariance As A Viable Alternative to Frequentist Methods*. Poster presented at The University of California, Merced Psychology Symposium, Merced, CA.

## Invited Presentations

1. **Winter, S. D.\*** (2022, October). *Returning meaning to 'good fit': Constraining the bifactor model via Bayesian prior specification*. Invited talk presented at the Quantitative Psychology Speaker Series at the University of California, Davis.
2. **Winter, S. D.\***, Bonifay, W., & Watts, A. (2022, September). *Prior Specification in Bayesian Estimation Affects a Model's Fitting Propensity*. Invited talk presented at the Quantitative Psychology seminar at the University of Missouri, Columbia, MO.
3. McCall, C\* & **Winter, S. D.\*** (2022, September). *Using intersectional research methods to examine intervention efficacy*. Invited roundtable Discussion presented at the Missouri Prevention Science Institute (MPSI) seminar.
4. **Winter, S. D.\*** (2022, April). *Assessing prior-data disagreement in Bayesian SEM*. Invited webinar presented at Young Statisticians Europe (YSE). A recorded version of this webinar can be found here: <https://www.youtube.com/watch?v=CuwHzd-8z4k>
5. **Winter, S. D.\*** (2022, March). *Introduction to Bayesian Analysis*. Invited talk presented at the College of Education and Human Development Lunch Hour, University of Missouri, MO.
6. **Winter, S. D.\*** (2021, November). *Basic Bayes*. Invited talk presented at the Missouri Prevention Science Institute (MPSI) seminar.
7. **Winter, S. D.\*** (2021, October). *Exploring Three Methods for Detecting Prior-Data Disagreement in Bayesian SEM*. Invited talk presented at the Quantitative Psychology seminar at the University of Missouri, Columbia, MO.
8. **Winter, S. D.\*** (2017, April). *Bayesian Approximate Measurement Invariance for Second-Order Latent Growth Models*. Invited talk presented at The University of California, Merced, CA.
9. Depaoli, S.\* & **Winter, S. D.\*** (2016, November). *A Systematic Review of Bayesian Papers in Psychology: The Last 25 Years*. Invited talk presented at The University of California, Merced Quantitative Psychology Colloquium, Merced, CA.

## Invited Workshops

1. **Winter, S. D.\*** (2022, March). *Creating Dynamic Reports from your Shiny App*. Invited talk presented at R-Ladies St. Louis. A recorded version of this webinar can be found here: <https://www.youtube.com/watch?v=MvGastDzLJk>
2. **Winter, S. D.\***, and Smid, S. C.\* (2020, July). *Dangers of Default Priors*. Invited post-conference workshop presented at S4, Utrecht, the Netherlands. (Conference canceled)
3. **Winter S. D.\*** & Coburn, K.\* (2019, April). *Creating an Interactive Shiny App to Share Your Research Findings*. One-day workshop presented at The University of California, Merced, CA. doi:10.17605/OSF.IO/69J37.
4. **Winter S. D.\*** (2015, June). *Statistics 101*. Workshop presented at DevOps Days Amsterdam, the Netherlands.

## TEACHING EXPERIENCE

### Instructor of Record

ESC PS 9710: Structural Equation Modeling

Spring 2023

**Guest Lectures**

ESC PS 8850: Quantitative Foundations in Educational Research - Logistic Regression	Fall 2023
ESC PS 8655: Item Response Theory - Estimating Person Parameters	Spring 2022
PSY 202B: Advanced Psychological Statistics II - Introduction to Mplus	Spring 2021
PSY 202B: Advanced Psychological Statistics II - Multilevel modeling with Mplus	Spring 2021
PSY 010: Analysis of Psychological Data - One-Sample <i>t</i> -test	Spring 2019
PSY 010: Analysis of Psychological Data - One-way ANOVA	Spring 2019
PSY 010: Analysis of Psychological Data - Independent Samples <i>z</i> -test	Fall 2017

**Graduate Teaching Assistant**

PSY 202B: Advanced Psychological Statistics II, graduate level Psychology course	Spring 2021
PSY 202A: Advanced Psychological Statistics I, graduate level Psychology course	Fall 2019, 2020
PSY 105: Advanced Research Methods in Psychology	Spring 2017
PSY 010: Analysis of Psychological Data	Fall 2017, 2018, Spring 2019
PSY 015: Research Methods in Psychology	Fall 2016, Spring 2018, 2020

**Laboratory Instructor**

PSY 010L: Analysis of Psychological Data	Fall 2017, 2018, Spring 2019
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**SERVICE****International & National**

Organizer, Symposium: Estimating PTSD Trajectories, Utrecht, The Netherlands	2015
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**University & Department**

Statistical Consultant, Missouri Prevention Science Institute	2021-2022
Moderator, program Twitter account: @UCM_QuantPsych (300+ followers)	2018-2021
Mentor, GradEXCEL Peer Mentor Program, Graduate Division	2019-2020
Member, Graduate Student Survey Committee for Graduate Program Review	2018
Student Representative, Quantitative Psychology Open-Rank Job Search Committee	2018

**Ad Hoc Reviewer**

Journals	<i>Psychological Methods</i> , <i>Structural Equation Modeling: A Multidisciplinary Journal</i> , <i>Behavior Research Methods</i> , <i>British Journal of Mathematical and Statistical Psychology</i> , <i>European Journal of Psychological Assessment</i> , <i>Communications in Statistics - Simulation and Computation</i> , <i>AERA Open</i> , <i>The European Journal of Psychotraumatology</i> (special issue on Bayesian Statistics), <i>Journal of Media Psychology</i> , <i>Prevention Science</i> , <i>Frontiers in Psychology</i> .
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**PROFESSIONAL DEVELOPMENT**

Missouri Prevention Science Institute (Dr. Chynna McCall), Equitable Endeavor for Everyone	2021-2022
A Meeting of Methodologies: Advancing Methods Development, Application, and Teaching in Psychology, the Behavioural, and Social Sciences	2020
The Center for Engaged Teaching and Learning, UC Merced, three-part seminar on remote instruction	2020
Professional Seminar on Teaching, UC Merced, a semester-long course on evidence-based teaching strategies, developing a syllabus, and effective communication	2018

The Center for Engaged Teaching and Learning, UC Merced, Fundamentals for TAs in Higher Education Certificate 2018

Women in Analytics Conference, Facebook HQ, one of 300 attendees out of 1500 applicants 2018

## PROFESSIONAL AFFILIATIONS

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Association for Psychological Science (APS)  
 National Council on Measurement in Education (NCME)  
 Psychometric Society  
 Society for the Improvement of Psychological Sciences (SIPS)

## SKILLS

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<b>Languages</b>	Dutch, English
<b>Software</b>	R, Mplus, BUGS/JAGS, Stan, HLM, SPSS, Git, Qualtrics
<b>Coding</b>	R, Python, HTML, css, $\LaTeX$ , Markdown
<b>Select Statistics</b>	Bayesian methods, Structural Equation Modeling, Item Response Theory, Multi-level Modeling, Measurement and Measurement Invariance, Finite Mixture Modeling, Longitudinal Data Analysis

## REFERENCES

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**Wes Bonifay, Ph.D.** *postdoctoral advisor*  
 Associate Professor  
 Educational, School & Counseling Psychology  
 College of Education & Human Development  
 University of Missouri - Columbia  
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**Sarah Depaoli, Ph.D.** *graduate advisor*  
 Professor  
 Quantitative Methods, Measurement, and Statistics  
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**Edgar C. Merkle, Ph.D.**  
 Professor  
 Psychological Sciences  
 College of Arts and Sciences  
 University of Missouri - Columbia  
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