

# Dr. Hairong Song

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Department of Psychology  
 University of Oklahoma  
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 Norman, OK 73019  
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## EDUCATION

- Ph.D. **Quantitative Psychology**, June 2009  
 University of California, Davis  
 Advisor: Dr. Emilio Ferrer  
 Dissertation: *Bayesian Analysis of Random Coefficient Dynamic Factor Models*
- M.A. **Developmental Psychology**, June 2004  
 East China Normal University, Shanghai, China  
 Advisor: Dr. Guopeng Chen  
 Thesis: *Attachment to Parents and Friends in Relation to Two Dimensions of Self-Esteem among Chinese Adolescents: A Developmental Perspective*
- B.S. **Mathematics**, June 2001  
 Dalian University, China  
 Thesis Mentor: Dr. Lianshan Shen  
 Honor Thesis: *An Application of Fractal Theory and Chaos Inversion Algorithm in Earthquake Prediction*

## RESEARCH INTERESTS

My research in quantitative methods lies in two areas: (a) intensive longitudinal data analysis and dynamical system analysis, including (single- and multi-level) dynamic factor analysis and time series analysis, and (b) psychometric evaluation of behavioral measures with Frequentist and Bayesian approaches. My substantive research focuses on substance uses and (mental) health outcomes among children, adolescents, and young adults.

## POSITION HELD

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|------------------|---|
| 2022.1 — present | Interim Chair, Department of Psychology, OU   |
| 2015.7 — present | Associate Professor, Department of Psychology, OU   |
| 2019.1 — 2020.8  | Director of Data Analytics, Biomedical & Behavioral Methodology Core, Department of Pediatrics, OU Health Sciences Center |
| 2009.8 — 2015.6  | Assistant Professor, Department of Psychology, OU   |

**GRANT****Working Proposals**

**NIH Centers of Biomedical Research Excellence (CoBRE)** 1/27/2022  
**“The Oklahoma Center for Population Health”**

PI: Dr. Paul Spicer (OU)

Role: Co-PI

**Pending**

**National Institutes of Health** 7/1/2022-6/30/2027  
**“A Dynamic Mobile Health Application for Smokers Who Are Not Ready to Quit” (R01)**

PI: Dr. Businelle (OUHSC)

Role: Co-PI (10%)

This proposed study involves collecting longitudinal data and ecological momentary assessment data from a large sample of participants who are not ready to quit smoking. As a Co-PI, I will direct the data analysis process, work with the team to conduct the planned analyses, assist with the interpretation of the data, and contribute to manuscript preparation.

**National Institutes of Health** 7/1/2022 – 6/30/2024  
**“Chronic Diseases and Smoking: Secondary Data Analysis Using Add Health Data” (R21)**

PI: Dr. Cheney (OU)

Role: Co-PI (25%)

The goal of this research is to establish chronic disease as a risk factor for future smoking and e-cigarette use using the five waves of data from the nationally-representative Add Health Study. I will conduct the data analysis to assess the (bi-directional) causal relationships between chronic diseases and smoking and e-cigarette use.

**Funded**

**Data Institute for Societal Challenges (DISC) Opioid Seed Grant** 06/2021  
**“The Health and Economic Impact of a New Multidisciplinary Clinic to Treat Infective Endocarditis (IE) due to Intravenous Drug Use (IDU)”**

PI: Dr. David Bard (OUHSC)

Role: Co-PI

My role in this project is to train and mentor undergraduate students to code the medical records and assist with data analysis as well.

**Early Childhood Education Institute Mini Grant** 07/2018 – 07/2019  
**“Developmental Trajectories of Child Outcomes and the Associations with Classroom, Teacher, and Family Characteristics: An Evaluation of CAP-Tulsa Program”**

Role: PI

I conducted a series of growth analyses to evaluate the effectiveness of a head-start program implemented in Tulsa, Oklahoma. The outcomes include social-emotional, behavioral, and cognitive variables. I also examined the collective impacts of classroom, teacher, and family characteristics on each of the outcomes.

**State of Oklahoma, Regents of Higher Education** 05/2011 – 05/2012  
**“Every Student Succeeds across the Curriculum with Writing”**

PI: Dr. Priscilla Griffith (OU)

Role: Data Analyst

To evaluate the impact of a Writing Curriculum on students’ academic performance, I conducted the data analysis using multilevel modeling techniques and report the results in writing.

**National Science Foundation of China** 01/2011-12/2013  
**“Pan-cultural Self-Enhancement: Behavioral and Neural Evidence from China”**

PI: Dr. Huajian Cai (Institute of Psychology, Chinese Academy of Sciences)

Role: Methodological Consultant

My role in this project is a methodological consultant. I provided assistance on survey designs and data analyses.

### Unfunded

Covid-19 Rapid Response Seed Grant, University of Oklahoma April 2020  
**“Maintaining, Hope, Health, and Human Flourishing During Social Distancing: Lessons Learned During a Natural Experiment in Society-Wide Social Isolation.”**

Total requested fund: \$28,325

Role: Co-PI

NIH Centers of Biomedical Research Excellence (CoBRE) 2019  
**“The Oklahoma Center for Native Health”**

Total requested fund: \$11,248,133

Role: Co-PI

Data Scholarship Initiatives, College of Arts and Sciences, OU 2019  
**“Child Well-Being Scales in the Assessment of Families and Children in Home- Care Intervention: An Validation Study”**

Total requested fund: \$10,000

Role: PI

NSF American Educational Research Association Research Grant 2018  
**“Using Bayesian SEM to Study Factorial Invariance”**

Total request fund: \$20,000

Dr. Dexin Shi (PI)

Role: Co-PI

National Science Foundation 2012  
**“Development and Application of Generalized Random Coefficients Dynamic Factor Models”**

Total request fund: \$274,319

Role: PI

### CONTRACT & FELLOWSHIP

Contract: The Educational, Training, Evaluation, Assessment and Measurement,  
College of Continuing Education, University of Oklahoma 10/2021-6/2022  
“Juveniles Recidivism in the State of Oklahoma”

Senior Faculty Summer Fellowship 06/2018-07/2018  
The College of Arts and Sciences, University of Oklahoma  
“Effects of Disrupted and Deprived Parental Relationship on Mental, Emotional, and  
Behavioral Health among China’s Left-Behind and Rural-to-Urban Immigrated Children.”

Junior Faculty Summer Fellowship 06/2013-07/2013  
The College of Arts and Sciences, University of Oklahoma  
“A Longitudinal Examination of Perceived Racial Discrimination among Adolescents of  
Mexican Origin”

Junior Faculty Summer Fellowship 06/2010-07/2010  
The College of Arts and Sciences, University of Oklahoma  
“Modeling Developmental Trajectories of Substance Use with Different Statistical Approaches”

## **PUBLICATIONS (\* Corresponding Author)**

### **Working Manuscripts**

Li, Y. & **Song, H.\*** (2022). Clustering Intensive Longitudinal Observations Based on Vector Autoregressive(VAR) Models.

He, H. & **Song, H.\*** (2022). Impact of Systematic Error Covariance on Measurement Invariance Tests Using Multiple-Group SEM approach.

### **Under Review**

Foster, S. D., Carvallo, M. R., **Song, H.**, Lee, J., Switzer, R. (Revised & Resubmitted) Honor endorsement and cardiovascular health outcomes. *Journal of Personality and Social Psychology*.

### **Published & In Press**

Chen, M., **Song, H.**, & Ferrer, E. (in press). Longitudinal Models for Assessing Dynamics in Dyadic Data. In Rick H. Hoyle. (Ed.) *Handbook of Structural Equation Modeling* (2nd). New York, NY: Guilford Press.

Lu, Y., Dobbis, P., **Song, H.**, Dunlap, C., & Cheney, M. (2021). Harm Perceptions, JUUL Dependence, and Other Tobacco Product Use Among Young Adult JUUL Users. *Addictive Behaviors*. doi: 10.1016/j.addbeh.2021.107210

Foster, S. D., Carvallo, **Song, H.**, M. R., Lee, J., & Lee, J. (2021). When culture and health collide: Feminine honor endorsement and attitudes towards catch-up HPV vaccinations in

college women. *Journal of American College Health*. 16; 1-9.

Thompson, Y, **Song, H.\***, Shi, D, & Liu, Z (2021). It Matters: Reference Indicator Selection in Measurement Invariance Tests. *Educational and Psychological Measurement*. 71(2), 306-324.

Shi, D., **Song, H.\***, & Lewis, M. (2019). The Impact of Partial Factorial Invariance in Cross-Group Comparisons. *Assessment*. 26(7), 1217-1233.

Shi, D., **Song, H.**, Distefano, C. & Maydeu-Olivares, A. (2018). Evaluating Factorial Invariance using Bayesian Structural Equation Modeling (BSEM): An Interval Estimation Approach. *Multivariate Behavioral Research*. DOI: 10.1080/00273171.2018.1514484

Klotz, A., Bolino, M.C., **Song, H.**, & Stornelli, J (2017). Examining the nature, causes, and consequences of profiles of organizational citizenship behavior. *Journal of Organizational Behaviors*. DOI: 10.1002/job.2259

Wang, Y., Wu, W., **Song, H.**, Wu, M., & Cai, H. (2017). The Development of Implicit Self-Esteem during Emerging Adulthood: A Longitudinal Analysis. *Social Psychological and Personality Science*. <https://doi.org/10.1177/1948550617726831>

**Song, H.** (2017). Book Review: Time Series Analysis and Its Applications with R Examples. *Structural Equation Modeling: A Multidisciplinary Journal*. 24, 800- 802.

Shi, D., **Song, H.\***, Liao, X., Terry, R., & Snyder, L.A. (2017). Bayesian SEM for Specification Search Problems in Testing Factorial Invariance. *Multivariate Behavioral Research*. 52(4), 430-444.

Watts, L. L., Steele, L. M., & **Song, H.** (2017). Re-examining the Relationship between Need for Cognition and Creativity: Predicting Creative Problem Solving Across Multiple Domains. *Creativity Research Journal*, 29, 21- 28.

He, Y., Zhou, X., Shi, D., **Song, H.** Zhang, H., & Shi, J. (2016) Causal Relationship between ANS Acuity and Arithmetic Ability in Elementary-School Students: A Longitudinal Cross-Lagged Analysis. *Frontiers in Psychology*, <http://dx.doi.org/10.3389/fpsyg.2016.01052>

Chung, C., Liao, X., **Song, H.**, & Lee, T (2015). Bifactor Approach to Modeling Multidimensionality of Physical Self-Perception Profile. *Measurement In Physical Education and Exercise Science*, 20(1).

Luo, L.L.Y., Cai, H., & **Song, H.** (2014) A Behavioral Genetic Study of Intrapersonal and Interpersonal Dimensions of Narcissism. *PLoS ONE*, 9(4): e93403. doi:10.1371/journal.pone.0093403.

Luo, L.L.Y., Sedikides, C., Cai, H., & **Song, H.** (2014). Distinguishing Communal Narcissism from Agentic Narcissism: A Behavior Genetics Analysis. *Journal of Research in Personality*, 49, 52-58.

- Song, H.\*** & Zhang, Z. (2014). Analyzing Multiple Multivariate Time Series Using Multilevel Dynamic Factor Models. *Multivariate Behavioral Research*, 49, 67-77.
- Luo, L. L. Y., Shi, Y., Cai, H., Wu, M., & **Song, H.** (2014). Liking for name predicts happiness: A genetic behavioral analysis. *Personality and Individual Difference*, 69, 156-161.
- Song, H.\***, & Ferrer, E. (2012). Bayesian Analysis of Random Coefficient Dynamic Factor Models. *Multivariate Behavioral Research*, 47, 26-60.
- Ferrer, E. & **Song, H.** (2012). Longitudinal Structural Models for Assessing Dynamics in Dyadic Interactions. In Rick H. Hoyle. (Ed.) *Handbook of Structural Equation Modeling*. New York, NY: Guilford Press.
- Cai, H., Fang, X., Yang, Z., & **Song, H.** (2012). Implicit Consumer Animosity: A Primary Validation. *Journal of Applied Social Psychology*. DOI: 10.1111/j.1559- 1816.2012.00911.x
- Song, H.\***, Cai, H, Brown, J.D., & Grimm, K.J (2011). Detecting and evaluating differential item functioning of the Rosenberg Self-Esteem Scale between the U.S. and China. *Asian Journal of Social Psychology*, 14, 176-188.
- Conger, R. D., **Song, H.**, Ferrer, E., & Stockdale, G. D. (2011). Resilience and vulnerability of Mexican origin youth and their families. In P. K. Kerig, M. S. Schulz, & S. T. Hauser (Eds. pp.268-286), *Adolescence and beyond: Family processes and development*. New York: Oxford University Press.
- Conger, R. D., Stockdale, G. D., **Song, H.**, Robins, R. W., & Widaman, K. F. (2011). Predicting change in problem behaviors of Mexican origin youth during the transition from childhood to adolescence. In Y. F. Thomas, L. N. Price, & A.V. Lybrand (Eds.), *Drug use trajectories among African American and Hispanic Youth*. New York: Springer.
- Song, H.**, & Ferrer, E. (2009). State-space modeling of dynamic psychological processes via the Kalman smoother algorithm: Rationale, finite sample properties, and applications. *Structural Equation Modeling*, 16, 338-363.
- Song, H.**, Thompson, A. R., & Ferrer, E. (2009). Attachment and self- evaluation in Chinese adolescents: Age and gender differences. *Journal of Adolescence*, 32, 1267-1286.
- Cai, H., Huang, X., & **Song, H.** (2008). The relationship between sex-role and subjective well-being among Chinese college students (in Chinese). *Acta Psychologica Sinica*, 40(4), 1-10.
- Song, H.** & Chen, G. (2003). A review on determinants of mother-children attachment security (in Chinese). *Psychological Science*, 26, 172-173.
- Shen, L., Li, J., **Song, H.**, & Wang, L. (2001). An application of fractal theory and chaos inversion algorithm in earthquake prediction (in Chinese). *Journal of Dalian University*, 22, 105-

110.

**Conference Presentations**

Cheney, M. K., Bhochhibhoya, S., Lu, Y., & **Song, H.** (2022, March 15-18). *Add Health Young Adult Asthma and E-cigarette Use*. Poster presented at the Society for Research on Nicotine & Tobacco 2022 Annual Meeting, Baltimore, MD.

Boozary, L.K., Ehlke, S.J., **Song, H.**, Alexander, A., Ra, K., Businelle, M., and Kendzor, D.E. (2022, March 15-18). *The Effect of Race on the Association between Adverse Childhood Experiences (ACEs) and Smoking Cessation Outcomes*. Poster presented at the Society for Research on Nicotine and Tobacco 2022 Annual Meeting, Baltimore, MD.

Li, Y, **Song, H.** & Wenger, M. (2020). *Using Bidirectional LSTM Recurrent Neural Networks to Study Effects of Iron Deficiency on Declarative and Procedural Memory Systems*. Accepted by the 32<sup>nd</sup> APS annual convention (cancelled due to COVID).

**Song, H.** & Jeon, S. (2019). *Dosage and Effectiveness: An Evaluation of CAP- Tulsa Program*. Early Childhood Education Institute Annual Board Meeting, Tulsa Oklahoma.

Li, Y & **Song, H.** (2019, May). *Comparing Data Mining Methods for Prediction of Social Distance*. Poster presented at the 31st APS annual convention, May 23- 26, Washington D.C.

Pomerantz, A., Green K., & **Song, H.** (2019, Feb). *Examining Honor Facets Across Gender and Ethnicity*. Poser presented at 2019 SPSP convention, Feb 7— 7, Portland.

Johnson, G., Dumani, S., & **Song, H.** (2018, April). *It's only the test? Gender differences in guilt-proneness measurement*. Poster presented at the 33rd Annual Conference of the Society for Industrial and Organizational Psychology, Chicago, IL.

**Song, H.** (2016). Multilevel Latent Class Analysis with Covariates: A 3-Step Approach. Symposium presentation at the 3<sup>rd</sup> Biennial Conference of Developmental Methods, September 22-September 24, Whitefish, Montana.

**Song, H.** & Shi, D. (2015). Solving Issues of Factorial Invariance with Bayesian Structural Equation Modeling. Poster presented at the 14th European Congress of Psychology, Milan, Italy.

**Song, H.**, Hernández, M.M., Conger, R., & Stockdale, G.D. (2013). *A Longitudinal Examination of Perceived Racial Discrimination among Adolescents of Mexican Origin: Patterns, Correlates, and Influences*. Poster presented the 2013 SRCD Biennial Meeting, April 18-20, 2013 in Seattle, Washington, USA.

Liao, X., **Song, H.**, Conger, R. D., & Stockdale, G.D. (2011). *Long-term Change of Relational Aggression among Mexican American Youth*. Poster presented at the 17<sup>th</sup> International Meeting of Psychometric Society, Hong Kong, China, July 18-July22, 2011.

**Song, H.** (2011). *Detecting and evaluating differential item functioning of the Rosenberg*

*Self-Esteem Scale between the U.S. and China*. Symposium presentation at the 9<sup>th</sup> Biennial Conference of the Asian Association of Social Psychology, Yunnan, China, July 28-July 31, 2011.

**Song, H.** (2010). *Bayesian Estimation of Random Coefficient Dynamic Factor Models*. Poster presented at 2010 APA Annual Meeting, San Diego, California, Aug 12-15.

**Song, H.**, Thompson, A. R., & Ferrer, E (2008). *Attachment and Self-Evaluation in Chinese Adolescents: Developmental and Gender Differences*. Poster presented at 2008 APA Annual Meeting, Boston, Aug. 14-17.

**Song, H.** & Ferrer, E. (2008). *Identifying the Dimensions of the Latent Time Series in Dynamic Factor Analysis*. Poster presented at 2008 APA Annual Meeting, Boston, Aug. 14-17.

Ferrer, E., **Song, H.**, & Widaman, K.F. (2007). *Modeling Dynamics in Dyadic Interactions with Individual Differences*. Research presented at the Human and Social Dynamics PIs Meeting. National Science Foundation, Washington, DC, October, 2007.

Fang, X., Cai, H., Yang, Z. & **Song, H.** (2007). *Examining the Animosity Model of Foreign Product Purchase from both Explicit and Implicit Perspectives*. Paper presented at 2007 APA Annual Meeting, San Francisco, August 17-20, 2007.

Wei, Y., **Song, H.**, Cai, H. (2007). *A Measurement Equivalence Analysis of Adolescent Attachment across Gender*. Paper presented at 2007 APA Annual Meeting, San Francisco, August 17-20, 2007.

**Song, H.** & Ferrer, E. (2006). *State-Space Modeling of Dynamic Psychological Processes via the EM Algorithm*. Paper presented at the 4th Annual Society of Multivariate Experimental Psychology Graduate Preconference, Lawrence, Kansas, Oct. 18-21, 2006.

Wei, Y., **Song, H.**, & Cai, H. (2006). *Structural Invariance of Parental Attachment of Adolescents: Evidence from China*. Paper presented at American Educational Research Association (AERA) 2006 Annual Meeting, San Francisco, California, April 7-11, 2006.

## **PROFESSIONAL DEVELOPMENT**

- 2006 Advanced Training Institute on Structural Equation Modeling in Longitudinal Research, American Psychological Association
- 2021 Write Winning NIH Grant Proposals (Nov. 15- 16), TSET Health Promotion Research Center co-sponsored by the Stephenson Cancer Center, OU.

## **HONORS and AWARDS**

### **2008 SMEP Dissertation Support Awards**

*Society of Multivariate Experimental Psychology*

2008 **Research Fellowship**, Department of Psychology, UC, Davis.

2006 **Student Travel Award**, Society of Multivariate Experimental Psychology. Travel



funding to attend the annual meeting of the Society of Multivariate Experimental Psychology (SMEP) meeting, Lawrence, KS.

## **EDITORIAL BOARD**

*Adversity and Resilience Science*

## **Ad hoc REVIEWER**

*Multivariate Behavioral Research*

*Structural Equation Modeling*

*Behavioral Research Methods*

*Psychological Methods*

*Methodology*

*European Journal of Psychological Assessment*

## **SERVICES**

### **Department**

2022 SP – 2022SU Interim Chair of the Department

2020 FA – present Program Head for Quantitative Psychology

2020 FA – present Awards Committee

2019 FA – present Graduate Assessment Liaison

2017 FA – 2022 Committee A

2019 FA Search Committee for 2 tenure-track positions in Quantitative Psychology

2019 FA Fund Raising Committee

2019 SP Search Committee for a Lecture position

2014 FA – 2020 FA Graduate Admission Committee

2013 FA – 2014 FA Library liaison

2011 Search committee for a tenure-track position in Quantitative Psychology program

2009.8 – 2013.8 Undergraduate Committee

### **College**

2019 FA – Present Member of Data Analytics group in College of Arts and Sciences

2019 SP Search Committee for a tenure-track position in Big Data, College of Arts and Sciences, OU

### **University**

2017.9 – 2019.9 Curriculum Equivalence Committee, Regents of Higher Education, State of Oklahoma

## **GRADUATE STUDENT SUPERVISION**

Yaqi Li, Ph.D student in progress

Marc Huang, Ph.D student in progress

Adon Rosen, Ph.D student in progress

Dexin Shi, Ph.D., Assistant Professor at the University of South Carolina

Xiaolan Liao, Ph.D, Data Analyst at Dell, Tulsa

Melie Lewis, MA, NBA Sacramento Kings

Yutian Thompson, Ph.D., Data Scientist at Health Science Center at OU

**COURSES OFFERED**

*Research Methods: Statistics* (undergraduate)  
*Introduction to Psychological Statistics* (graduate)  
*General Linear Models* (graduate)  
*Advanced Structural Equation Models* (graduate)  
*Hierarchical Linear Models* (graduate)  
*Introduction to Structural Equation Models* (graduate)

**WORKSHOP/PRESENTATIONS*****Invited/Honored***

2018.10      *Do We Measure the Same Thing Across Groups or Time?*  
 Early Childhood Education Institute, University of Oklahoma

2014 Summer      Courses on *General Linear Models* and *Hierarchical Linear Models*,  
 Institute of Psychology, Chinese Academy of Science, Beijing, China

2014 Summer      Workshop on *Advanced Structural Equation Modeling*, College of  
 Psychology, Beijing Normal University, Beijing, China

2011 Summer      One week workshop on *Hierarchical Linear Modeling* and *Longitudinal*  
*Modeling*, Shanghai University of Finance and Economics, Shanghai, China

2010 Summer      Three-day workshop on *Hierarchical Linear Modeling*, Institute of  
 Psychology, Chinese Academy of Sciences, Beijing, China

2009.12      *An Introduction to Hierarchical Linear Modeling*, Department of  
 Psychology, IO Graduate Students Seminar, OU

2009.11      *Implicit Consumer Animosity and Chinese Consumption of Japanese*  
*Products*, Institute for US-China Issues, OU

2007.11      *Developmental and Gender Differences in Attachments and Their*  
*Relationships with Self-Evaluations among Chinese Adolescents*,  
 Department of Psychology, Developmental Colloquium series, UCD

2006.10      *State-Space Modeling of Dynamic Psychological Processes via The*  
*EM algorithm*, Annual Meeting of Society for Multivariate  
 Experimental Psychology Lawrence, KS