Woojae Kim

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EDUCATION

Ph.D., **Ohio State University**, Columbus, OH *2007*
Major: Quantitative Psychology (Department of Psychology)
Minor: Statistics (Department of Statistics)
Co-advisors: Jay I. Myung, Ph.D. & Mark A. Pitt, Ph.D.
Dissertation: *Understanding the Connectionist Modeling of Quasiregular Mappings in Reading Aloud*

M.A., **Ohio State University**, Columbus, OH *2002*
Major: Quantitative Psychology (Department of Psychology)
Advisor: Jay I. Myung, Ph.D.
Thesis: *Applications of Markov Chain Monte Carlo in MDL-Based Model Selection*

B.A., **Seoul National University**, Seoul, Korea *1998*
Major: Education

EMPLOYMENT HISTORY

Assistant Professor, **Howard University**, Department of Psychology *2015–Present*

Research Scientist, **Ohio State University**, Department of Psychology *2011–2015*

Manager, Research & Education Team, **EduCherry Donga Inc.**, *2010–2011*
Seoul, Korea

Post-doctoral Research Fellow, **Indiana University** *2007–2009*
Co-advisors: Dr. Jerome Busemeyer & Dr. Richard Shiffrin

Statistical Consultant, **Ohio State University**, Department of Psychology *2005–2006*

RESEARCH INTERESTS

Quantitative / Mathematical Psychology

Bayesian Methods, Computational Cognition, Optimal Experimental Design, Statistical Model Selection, Neural Networks

GOOGLE SCHOLAR CITATION DATA

Citation count: 807
h-index: 8
i10-index: 8
URL: https://scholar.google.com/citations?user=NTYc27IAAAAJ&hl=en

RESEARCH GRANTS

National Science Foundation (BCS-1834323; co-funded by the Methodology, Measurement, and Statistics [MMS] and Perception, Action, and Cognition [PAC] programs). Title: *Toward a General Framework for Optimal Experimentation in Computational Cognition.* Amount: $299,794. **Role: PI** (sole investigator). 2018–2020.

National Institute of Mental Health (under review). Title: *Improving Child Mental Health Service Utilization in Ibadan Nigeria Using a Community Based Participatory Research Approach.* Amount: $329,019. **Role: Co-I** (PI: Ezer Kang).

PEER REVIEWED JOURNAL PUBLICATIONS

Kim, W., Pitt, M.A., Lu, Z.-L., & Myung, J. I. (2017). Planning beyond the next trial in adaptive experiments: A dynamic programming approach. *Cognitive Science, 41*(8), 2234–2252.

Steegen, S., Kim, W., Pestman, W., Tuerlinckx, F., & Vanpaemel, W. (2017). A theoretical note on the prior information criterion. *Journal of Mathematical Psychology, 80*, 33–39.

Armstrong, B. C., Dumay, N., Kim, W., & Pitt, M. A. (2017). Generalization from newly learned words reveals structural properties of the human reading system. *Journal of Experimental Psychology: General, 146*(2), 227–249.

Hou, F., Lesmes, L. A., Kim, W., Gu, H., Pitt, M. A., Myung, J. I., & Lu, Z.-L. (2016). Evaluating the performance of the quick CSF method in detecting contrast sensitivity function changes. *Journal of Vision, 16*(6):18, 1–19.

Gu, H., Kim, W., Hou, F., Lesmes, L. A., Pitt, M. A., Lu, Z.-L., & Myung, J. I. (2016). A hierarchical Bayesian approach to adaptive vision testing: A case study with the contrast sensitivity function. *Journal of Vision, 16*(6):15, 1–17.

Kim, W., Pitt, M. A., Lu, Z.-L., Steyvers, M., & Myung, J. I. (2014). A hierarchical adaptive approach to optimal experimental design. *Neural Computation, 26*(11), 2465-2492.

Kim, W., Pitt, M. A., & Myung, I. J. (2013). How do PDP models learn quasiregularity? *Psychological Review, 120*(4), 903-916.

Lodewyckx, T., Kim, W., Lee, M. D., & Wagenmakers, E.-J. (2011). A tutorial on Bayes factor estimation with the product space method. *Journal of Mathematical Psychology, 55*, 331-347.

Ahn, W. Y., Krawitz A., Kim, W., Busemeyer, J. R., & Brown, J. W. (2011). A model-based fMRI analysis with hierarchical Bayesian parameter estimation. *Journal of Neuroscience, Psychology, and Economics, 4*(2), 95-110.

Fridberg, D.J., Queller, S., Ahn, W.Y., Kim, W., Bishara, A.J., Busemeyer, J.R., Porrino, L., & Stout J.C. (2010). Cognitive mechanisms underlying risky decision-making in chronic cannabis users. *Journal of Mathematical Psychology, 54*(1), 28-38.

Shiffrin, R. M., Lee, M. D., Kim, W., & Wagenmakers, E.-J. (2008). A survey of model evaluation approaches with a tutorial on hierarchical Bayesian methods. *Cognitive Science, 32*(8), 1248-1284.

Pitt, M. A., Kim, W., Navarro, D. J., & Myung, J. I. (2006). Global model analysis by parameter space partitioning. *Psychological Review, 113*(1), 57-83.

Pitt, M. A., Kim, W., & Myung, I. J. (2003). Flexibility vs generalizability in model selection. *Psychonomic Bulletin & Review, 10*, 29-44.

PEER REVIEWED CONFERENCE PAPERS

Kim, W., Pitt, M. A., Lu, Z.-L., M., Steyvers, M., Gu, H., & Myung, J. I. (2014). A hierarchical adaptive approach to the optimal design of experiments. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp. 749-754). Austin, TX: Cognitive Science Society.

Kim, W., Navarro, D. J., Pitt, M. A. & Myung, I. J. (2004). An MCMC-based method of comparing connectionist models in cognitive science. *Advances in Neural Information Processing Systems, vol. 16*. Cambridge, MA: MIT Press.

Navarro, D. J., Myung, I. J., Pitt, M. A., & Kim, W. (2003). Global model analysis by landscaping. In R. Alterman & D. Kirsh (Eds.), *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*, CD-ROM format, (Boston, MA: August, 2003).

BOOK CHAPTERS

Myung, I. J., Pitt, M. A., & Kim, W. (2005). Model evaluation, testing and selection. In K. Lambert and R. Goldstone (eds.), *The Handbook of Cognition*. Thousand Oaks, CA: Sage.

MANUSCRIPTS IN PROGRESS

Kim, W. ASOME: A Python module for adaptive stimulus optimization of model-based experimentation.

Kim, W. Psychometric function smack down: Is the Bayesian optimal procedure superior to the simple staircasing?

Kim, W., Pitt, M. A. & Myung, I. J. Bayesian adaptive estimation of stop-signal reaction time distributions.

Kim, W. & Hill, R. Modeling common factors of frequency-based response scales.

Kim, W. Bayesian comparison of cognitive models via sequential Monte Carlo sampling.

INVITED PRESENTATIONS

Kim, W. (May, 2016). Multivariate Research Methods and Statistics. Invited as a co-leader of the workshop funded by Educational Testing Service at the *NAEP-Howard Statistics and Evaluation Institute*, *Howard University*, Washington D.C.

Kim, W. (July, 2015). Dynamic programming: Planning beyond the next trial in adaptive experiments. Invited presentation at *CogSci 2015 Workshop on Optimizing Experimental Designs: Theory, Practice, and Applications*, 37th Annual Meeting of the Cognitive Science Society, Pasadena, CA.

Kim, W. (October, 2014). How Do PDP Models Learn Quasiregularity? Invited presentation at *Department of Psychology, Seoul National University*, Seoul, Korea.

Kim, W. (January, 2011). Bayesian Data Analysis Using WinBUGS. Invited tutorial presentation at *Department of Psychology, Seoul National University*, Seoul, Korea.

Kim, W. (October, 2010). Towards Better Methods of Evaluating Theoretical Explanations of Data in Cognitive Science. Invited presentation at *Interdisciplinary Cognitive Science Program, Seoul National University*, Seoul, Korea.

Kim, W. (July, 2009). Introduction to Mathematical Psychology. Invited presentation at *Department of Psychology, Yonsei University*, Seoul, Korea.

Kim, W. (July, 2009). Model Selection Problems in Statistical Techniques. Invited presentation at *Department of Psychology, Yonsei University*, Seoul, Korea.

Kim, W. (June, 2008). Using WinBUGS for Bayes Factor Calculation. Invited tutorial presentation at *Department of Psychology, Ohio State University*, Columbus, Ohio.

Kim, W., Pitt, M. A., Navarro, D., & Myung, I. J. (May, 2006). Parameter Space Partitioning: A Method of Global Model Analysis. Invited presentation at *Department of Psychological & Brain Sciences, Indiana University*, Bloomington, Indiana.

CONFERENCE PRESENTATIONS

Kim, W., Pitt, M. A., & Myung, I. J. (2018). Fully adaptive estimation of stop-signal reaction-time distributions. Paper presented at the Annual Mathematical Psychology Meeting, Madison, WI.

Kim, W., Pitt, M. A., Lu, Z.-L., & Myung, I. J. (2017). Planning beyond the Next Trial in Adaptive Experiments: A Dynamic Programming Approach. Paper presented at the Annual Mathematical Psychology Meeting, Coventry, UK.

Hou. F., Lesmes, L., Kim, W., Gu, H., Pitt, M. A., Myung, I. J., & Lu, Z.-L. (2017). Predicting the Contrast Sensitivity Function in Different Luminance Conditions. Poster presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Baltimore, MD.

Myung, I. J., Kim, W., Gu, H., Lu, Z.-L., & Pitt, M. A. (2016) A Hierarchical Bayesian Approach to Adaptive Design Optimization. Paper presented at the 57th Annual Meeting of the Psychonomic Society, Boston, MA.

Armstrong, B. C., Dumay, N., Kim, W., & Pitt, M. A. (2016). Generalization from newly learned words reveals structural properties of the human reading system. Paper presented at the 57th Annual Meeting of the Psychonomic Society, Boston, MA.

Kim, W., Pitt, M. A., & Myung, I. J. (2015). Optimizing the efficiency of estimating stop-signal reaction time distributions via Bayesian adaptive experimentation. Poster presented at the Annual Meeting of the Psychonomic Society, Chicago, IL.

Kim, W., Pitt, M. A., & Myung, I. J. (2015). Estimating stop-signal reaction time distributions via Bayesian adaptive experimentation. Paper presented at the Annual Mathematical Psychology Meeting, Newport Beach, CA.

Gu, H., Kim, W., Hou. F., Lu, Z.-L., Pitt, M. A., & Myung, I. J. (2015). Hierarchical Adaptive Estimation of the Contrast Sensitivity Function (CSF): Part I Effect of Sample Size. Poster presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Denver, Colorado.

Pitt, M. A., Gu, H., Hou. F., Kim, W., Lu, Z.-L., & Myung, I. J. (2015). Hierarchical Adaptive Estimation of the Contrast Sensitivity Function (CSF): Part II Effect of Type of Prior. Poster presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Denver, Colorado.

Hou. F., Lesmes, L., Kim, W., Gu, H., Pitt, M. A., Myung, I. J., & Lu, Z.-L. (2015). Evaluating the sensitivity of the quick CSF method for detecting changes in contrast sensitivity. Poster presented at the Annual Meeting of the Association for Research in Vision and Ophthalmol-

ogy, Denver, Colorado.

Lu, Z.-L., Hou. F., Lesmes, L., Kim, W., Gu, H., Pitt, M. A., & Myung, I. J. (2015). A large-sample study for evaluating the precision of the quick CSF method. Poster presented at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Denver, Colorado.

Kim, W., Pitt, M. A., Lu, Z.-L., Steyvers, M., & Myung, I. J. (2014). A hierarchical adaptive approach to the optimal design of experiments. Paper presented at the Annual Meeting of the Cognitive Science Society, Quebec City, Canada.

Kim, W., Pitt, M. A., Lu, Z.-L., Steyvers, M., & Myung, I. J. (2014). A hierarchical adaptive approach to the optimal design of experiments. Paper presented at the Annual Mathematical Psychology Meeting, Quebec City, Canada.

Kim, W., Pitt, M. A., Lu, Z.-L., Steyvers, M., & Myung, I. J. (2014). A hierarchical adaptive approach to optimal experimental design. Paper presented at the Midwest Cognitive Science Conference, Dayton, OH.

Kim, W., Pitt, M.A., Lu, Z.-L., & Myung, J. I. (2014). How far can we look ahead in designing our experiment? Paper presented at the 52nd Edwards Bayesian Research Conference, Fullerton, CA.

Kim, W., Pitt, M. A., & Myung, I. J. (2013). How Do PDP Models Learn Quasiregularity? Poster presented at the Annual Meeting of the Psychonomic Society, Toronto, Ontario, Canada.

Kim, W., Pitt, M. A., & Myung, I. J. (2013). How Do PDP Models Learn Quasiregularity? Paper presented at the Annual Mathematical Psychology Meeting, Potsdam, Germany.

Kim, W., Pitt, M. A., & Myung, I. J. (2012). Optimal experimental design for model discrimination: A nonparametric extension. Paper presented at the Annual Mathematical Psychology Meeting, Columbus, OH.

Kim, W., Pitt, M. A., Myung, I. J., & Steyvers, M. (2012). Optimal experimental design for model discrimination in cognitive science: A nonparametric extension. Paper presented at the World Meeting of International Society for Bayesian Analysis, Kyoto, Japan.

Kim, W., & Shiffrin R. M. (2009). Incorporating prior beliefs of data into statistical model selection. Paper presented at the Annual Mathematical Psychology Meeting, Amsterdam, Netherlands.

Ahn, W. Y., Krawitz A., Kim, W., Busemeyer, J. R., & Brown, J. W. (2008). Neural correlates of subjective values: a model-based fMRI study. Paper presented at the Annual Meeting of the Society for Neuroscience, Washington D.C.

Kim, W., Ahn, W. Y., & Busemeyer, J. R. (2008). Hierarchical Bayesian analysis of cocaine abuser data using the Expectancy-Valence model of Iowa Gambling Task. Paper presented at the Annual Mathematical Psychology Meeting, Washington D.C.

Kim, W. (2007). Understanding the connectionist modeling of quasi-regular mappings in reading aloud. Paper presented at the Annual Mathematical Psychology Meeting, Irvine, CA.

Kim, W. & Shiffrin, R. M. (2007). Model Selection under Individual Differences. Poster presented at the Annual Mathematical Psychology Meeting, Irvine, CA.

Kim, W. & Shiffrin, R. M. (2007). Model Selection with Data under Individual Differences. Paper presented at the Sixth Annual Summer Interdisciplinary Conference, Kalymnos, Greece.

Kim, W. (2006). How does a distributed connectionist model work?: An analysis of reading network. Paper presented at the Annual Mathematical Psychology Meeting, Vancouver, B.C., Canada.

Kim, W. (2005). Understanding hidden unit representations in distributed connectionist models. Paper presented at the Annual Mathematical Psychology Meeting, Memphis, TN.

Kim, W., Pitt, M. A., Navarro, D., & Myung, I. J. (2004). Parameter space partitioning: A method of global model analysis. Paper presented at the Annual Mathematical Psychology Meeting, Ann Arbor, MI.

Kim, W., Navarro, D., Pitt, M. A., & Myung, I. J. (2003). An MCMC-based method of comparing connectionist models in cognitive science. Paper presented at the 17th Annual Conference of Neural Information Processing Systems, Vancouver & Whistler, Canada.

Myung, I. J., Kim, W., Navarro, D., & Pitt, M. A. (2003). Model complexity and mimicry: A case study of connectionist models of speech perception. Paper presented at the 2003 Annual Mathematical Psychology Meeting, Ogden, UT.

Pitt, M. A., Myung, I. J., Navarro, D., & Kim, W. (2003). Landscaping: A method for distinguishing quantitative models. Paper presented at Four Corners Workshop Series in Psycholinguistics, Nijmegen, Netherlands.

Navarro, D., Myung, I. J., Pitt, M. A., & Kim, W. (2003). Global model analysis by landscaping. Paper presented at the Annual Meeting of the Cognitive Science Society, Boston, MA.

Kim, W., Pitt, M. A., & Myung, I. J. (2002). Flexibility versus generalizability in model selection. Paper presented at the Annual Mathematical Psychology Meeting, Oxford, OH.

Kim, W., Myung, I. J., & Pitt, M. A. (2001). MDL Based Model Selection Using Markov Chain Monte Carlo. Paper presentation at the Annual Mathematical Psychology Meeting, Providence, RI.

AWARDS

Fred Brown Research Award, Department of Psychology, Ohio State University *2013–2014*

The best research paper of the year (for the Psychological Review paper "How do PDP models learn quasiregularity?")

Fred Brown Research Award, Department of Psychology, Ohio State University *2006–2007*

The best research paper of the year (for the Psychological Review paper "Global model analysis by parameter space partitioning")

TEACHING EXPERIENCE & INTERESTS

Courses Taught (at Howard University)

Undergraduate Level

- PSYC 003: Statistics I (Fall 2016, 2017)
- PSYC 004: Statistics II (Spring 2016, 2017; Fall 2017, 2018)

Graduate Level

- PSYC 205: Graduate Research Methods (Fall 2015, 2016; Spring 2018; Fall 2018)

- PSYC 209: Multivariate Statistics (covering up to exploratory factor analysis) (Spring 2016, 2018)
- PSYC 216: Structural Equation Modeling (based on the covariance-based approach) (Spring 2017)

Interested in Teaching

- Introduction to Mathematical Psychology (undergraduate-honor or graduate level)
- Introduction to Cognitive Science—An Interdisciplinary Study of the Mind (undergraduate level)
- Bayesian Statistics (can be adapted for either undergraduate or graduate level)
- Bayesian Cognitive Modeling (undergraduate-honor or graduate level)
- Neural Network Modeling (graduate level)

RESEARCH SUPERVISION

Doctoral Students

- Ricco Hill (2017–present; co-advised with Dr. Jules Harrell)
- Warren Scott (2017–present; co-advised with Dr. Jamie Barden)
- Cassandra Shivers (2016–2018; co-advised with Dr. Angela Cole Dixon)
- Janel Jill (2016–2017; co-advised with Dr. Angela Cole Dixon)

Dissertation/Thesis Committees

- Mary K. Howell (Spring 2018)
- Joshua Johnson (Spring 2018)
- Brianna Brower (Spring 2017)
- Kelsey Ball (Spring 2016)

Undergraduate Students

- Jayda Farmer (2017–present)
- Kandysee Leonard (2017–present)
- Stacia King (2017–present)
- Emi Williams (2017–present)

Statistical Consulting for Dissertation/Thesis Research (alphabetical)

Maxwell Anderson, Imer Arnautovic, Kelsey Ball, Brianna Brower, Mary K. Howell, Arshdeep Kaur, Sharlene Leong, and Clint Walker

DEPARTMENT & UNIVERSITY SERVICE

- Chair of Quantitative Area New Faculty Search Committee (2017–2018; chaired two consecutive search efforts)
- Committee on Graduate Studies (2016–present; prepared and presented plans for PhD Minor in Quantitative Psychology)
- Departmental Assessment Committee (2016–present)
- Cognitive Area New Faculty Search Committee (Spring 2017)

- Proposal committee for a Computational Science Interdisciplinary Studies Major in the College of Arts and Sciences (Spring 2016)

PROFESSIONAL SERVICE

- Ad Hoc Journal Reviewer for *Decision*, *Psychological Review*, *Cognitive Science*, *Behavior Research Methods*, *Journal of Mathematical Psychology*, *Multivariate Behavioral Research*, *Psychonomic Bulletin & Review*, *Scientific Reports*, and *PLOS ONE*
- Ad Hoc Grant Reviewer for *Air Force Office of Scientific Research*, *National Science Foundation*, and *Netherlands Organisation for Scientific Research*
- Grant Review Panelist for *National Science Foundation*
- Reviewer for annual *Intel/Regeneron Science Talent Search* administered by the *Society for Science & the Public* (2015–present)
- Local Organizing Committee for 2014 Asia-Pacific Conference on Computational Behavioral Sciences (APCCBS*2014)

PROFESSIONAL AFFILIATIONS

Society for Mathematical Psychology

Cognitive Science Society

International Society for Bayesian Analysis

Psychonomic Society