

CURRICULUM VITAE

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PERSONAL INFORMATION

Citizen of the United States

EDUCATION

Ph.D. 1990 Psychology, Purdue University, West Lafayette, Indiana
M.S. 1988 Psychology, Purdue University, West Lafayette, Indiana
M.S. 1982 Biological Sciences and Engineering, KAIST, Korea
B.S. 1980 Physics, Seoul National University, Korea

ACADEMIC APPOINTMENTS

1991 - present Assistant/Associate Professor and Professor of Psychology, Ohio State University
2009 spring Visiting Professor, Seoul National University, Seoul, Korea
1999 - 2000 Visiting Professor, Korea Advanced Institute of Science and Technology (KAIST)
1993 summer Visiting Scholar, Stanford University
1990 - 1991 Postdoctoral Research Associate, University of Virginia

GRANTS AND AWARDS

NIH grant titled "Methods for Selecting among Mathematical Models of Cognition." PI (Co-PI: Mark A. Pitt), \$715,000 (2006-2010), \$660,000 (2001-2006), \$230,000 (1998-2001).
AFOSR grant (cooperative agreement) titled "Establishment of a Data Repository for Cognitive Modeling." PI (co-PI: Mark A. Pitt), \$375,000 (2009-2011).
NSF grant titled "Collaborative Research: Bayesian Approaches for Testing Axioms of Measurement." PI, \$83,000, 2003-2006.
Fred Brown Research Award (\$5,000), Department of Psychology, Ohio State University, 2003 & 2007.
New Investigator Award, Society for Mathematical Psychology, 1995.
National Science and Engineering Research Council of Canada collaborative grant titled "Characterization problems in the mathematical social sciences using stochastic modeling and functional equation techniques." Co-PI, CD\$285,000, 1994-1997.
Ohio State University Office of Research Seed Grant, PI, \$11,100, 1992-1993.

RESEARCH INTERESTS

Cognitive and Mathematical Psychology: Model Evaluation and Comparison in Cognitive Modeling, Models of Memory Retention and Category Learning, Bayesian tests of decision making axioms, Connectionist Models of Speech Perception, Markov chain Monte Carlo Methods, Bayesian optimal experiment designs.

PUBLICATIONS

Cavagnaro, D. R., Pitt, M. A. & Myung, J. I. (In press). Adaptive design optimization in experiments with people. *Advances in Neural Information Processing Systems, vol. 21*, xxx-xxx. MIT Press.

Cavagnaro, D. R., Myung, J. I., Pitt, M. A. & Kujala, J. (In press). Adaptive design optimization: A mutual information based approach to model discrimination in cognitive science. *Neural Computation*.

Myung, J. I., Pitt, M. A., Tang, Y. & Cavagnaro, D. R. (In press). Bayesian adaptive optimal design of psychology experiments. In *Proceedings of the 2nd International Workshop in Sequential Methodologies (IWSM2009)* (Troyes, France: June, 2009). CD-ROM format.

Cavagnaro, D. R. Tang, Y., Myung, J. I., Tang, Y. & Pitt, M. A. (2009). Better data with fewer participants and trials: Improving experimental efficiency with adaptive design optimization. In N. A. Taatgen & H. Van Rijn (eds.), *Proceedings of the 31st Annual Meeting of the Cognitive Science Society* (pp. 93-98). Austin, TX: Cognitive Science Society.

Myung, J. I. & Pitt, M. A. (2009). Optimal experimental design for model discrimination. *Psychological Review, 116*, 499-518.

Myung, J. I., Tang, Y. & Pitt, M. A. (2009). Evaluation and comparison of computational models. *Methods in Enzymology, 454*. 287-304.

Pitt, M. A., Myung, J. I., Montenegro, M. & Pooley, J. (2008). Measuring model flexibility with parameter space partitioning: An introduction and application example. *Cognitive Science, 32*, 1285-1303.

Myung, J. I., Karabatsos, G., & Iverson, G. J. (2008). A statisticians view on Bayesian evaluation of informative hypotheses. In H. Hoijtink, I. Klugkist, P. Boelen (eds.), *Bayesian Evaluation of Informative Hypotheses* (pp. 309-327). Springer, Berlin.

Myung, J. I., Pitt, M. A. & Navarro, D. J. (2007). Does response scaling cause the generalized context model to mimic a prototype model? *Psychonomic Bulletin & Review, 14*, 1043-1050.

Myung, J. I., Montenegro, M., & Pitt, M. A. (2007). Analytic expressions for BCDMEM models of recognition memory. *Journal of Mathematical Psychology, 51*, 198-204.

Pitt, M. A., Myung, J. I. & Altieri, N. (2007), Modeling the word recognition data of Vitevitch and Luce (1998): Is it ARTful? *Psychonomic Bulletin & Review, 14*, 442-448.

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

- Myung, J. I., Navarro, D. J. & Pitt, M. A. (2006). Model selection by normalized maximum likelihood. *Journal of Mathematical Psychology*, 50, 167-179.
- Myung, J. I., Karabatsos, G., & Iverson, G. J. (2005). A Bayesian approach to testing decision making axioms. *Journal of Mathematical Psychology*, 49, 205-225.
- Myung, J. I., Pitt, M. A. & Navarro, D. J. (2005). Model selection in cognitive science as an inverse problem. *Proceedings of SPIE*, 5674, 219-228.
- Myung, I. J., & Navarro, D. J. (2005). Information matrix. In B. Everitt & D. Howel (eds.), *Encyclopedia of Statistics in Behavioral Science*, Vol. 2, 923-924. Wiley.
- Navarro, D. J. & Myung, I. J. (2005). Model evaluation. In B. Everitt & D. Howel (eds.), *Encyclopedia of Statistics in Behavioral Science*, Vol. 3, 1239-1242. Wiley.
- Grunwald, P., Myung, I. J., & Pitt, M. A., eds., (2005). *Advances in Minimum Description Length: Theory and Applications*. MIT Press.
- Su, Y., Myung, I. J. & Pitt, M. A. (2005). Minimum description length and cognitive modeling. In I. J. Myung, I. J., & M. A. Pitt (eds.) *Advances in Minimum Description Length: Theory and Applications*, pp. 411-433. MIT Press.
- 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*, pp. 422-436. Sage Publication.
- Myung, I. J. & Pitt, M. A. (2004). Model comparison methods. *Methods in Enzymology*, 383, 351-366.
- 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, 937-944. MIT Press.
- Navarro, D. J., Pitt, M. A. & Myung, I. J. (2004). Assessing the distinguishability of models and the informativeness of data. *Cognitive Psychology*, 49, 47-84.
- 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).
- Myung, I. J. (2003). Tutorial on maximum likelihood estimation. *Journal of Mathematical Psychology*. 47, 90-100
- Pitt, M. A., Kim, W. & Myung, I. J. (2003). Flexibility vs generalizability in model selection. *Psychonomic Bulletin & Review*, 10, 29-44
- Myung, I. J. & Pitt, M. A. (2003). Model fitting. In L. Nadel (ed.), *The Encyclopedia of Cognitive Science*, Vol. 3, pp. 47-51. London, UK: Macmillan.
- Pitt, M A & Myung, I J. (2002). When a good fit can be bad. *Trends in Cognitive Science*, 6, 421-425.

- Pitt, M. A., Myung, I. J., & Zhang, S. (2002). Toward a method of selecting among computational models of cognition. *Psychological Review*, *109*, 472-491.
- Myung, I. J., & Pitt, M. A. (2002). Mathematical modeling. In J. Wixted (ed.), *Stevens' Handbook of Experimental Psychology (Third Edition), Volume IV (Methodology)*, pp. 429-459. New York, NY: John Wiley & Sons.
- Myung, I. J. (2001). Computational approaches to model evaluation. In N. J. Smelser and P. B. Baltes (es.), *The International Encyclopedia of the Social and Behavioral Sciences*, pp. 2453-2457. Oxford, UK: Elsevier.
- Myung, I. J. & Pitt, M. A. (2001). A minimum description length approach for selecting among qualitative models of cognition. In *Proceedings of the Third International Conference on Cognitive Science (ICCS2001: Beijing, China)*, pp. 364-369.
- Myung, I. J., Pitt, M. A., Zhang, S., & Balasubramanian, V. (2001). The use of MDL to select among computational models of cognition. *Advances in Neural Information Processing Systems 13*, pp. 38-44. MIT Press.
- Myung, I. J., Balasubramanian, V., & Pitt, M. A. (2000). Counting probability distributions: Differential geometry and model selection. *Proceedings of the National Academy of Sciences USA*, *97*, 11170-11175.
- Myung, I. J., Kim, C., & Pitt, M. A. (2000). Toward an explanation of the power-law artifact: Insights from response surface analysis. *Memory & Cognition*, *28*, 832-840.
- Myung, I. J., Forster, M., & Browne, M. W., eds. (2000). A special issue on model selection. *Journal of Mathematical Psychology*, *44*, pp. 1-231.
- Myung, I. J. (2000) The Importance of complexity in model selection. *Journal of Mathematical Psychology*, *44*, 190-204.
- Myung, I. J., Brunstman IV, A. E., & Pitt, M. A. (1999). True to thyself: Assessing whether computational models of cognition remain faithful to their theoretical principles. In M. Hahn & S.C. Stoness (eds.), *Proceedings of the 21st Annual Conference of the Cognitive Science Society*, pp. 462-467. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Myung, I. J., & Pitt, M. A. (1998). Issues in selecting mathematical models of cognition. In J. Grainger & A. M. Jacobs (eds.), *Localist Connectionist Approaches to Human Cognition* (pp. 327-355). Lawrence Erlbaum Associates.
- Myung, I. J., & Pitt, M. (1997). Applying Occam's razor in modeling cognition: A Bayesian approach. *Psychonomic Bulletin & Review*, *4(1)*, 79-95.
- Myung, I. J., Kim, C., & Levy, W. B. (1997). Context-dependent recognition in a self-organizing recurrent network. In M.G. Shafto & P. Langley (eds.), *Proceedings of the Nineteenth Annual Meeting of the Cognitive Science Society*, pp. 530-535. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Myung, I. J., & Shepard, R. N. (1996). Maximum entropy inference and stimulus generalization. *Journal of Mathematical Psychology*, *40*, 342-347.

Myung, I. J., Ramamoorti, S., & Bailey, A. D., Jr (1996). Maximum entropy aggregation of expert predictions. *Management Science*, 42, 1420-1436.

Kim, C., & Myung, I. J. (1995). Incorporating real-time random effects in neural networks: a temporal summation mechanism. In J.D. Moore & J.F. Lehman, *Proceedings of the Seventeenth Annual Meeting of the Cognitive Science Society*, pp. 472-477, Hillsdale, NJ: Erlbaum Associate.

Myung, I. J. (1994) Maximum entropy interpretation of decision bound and context models of categorization. *Journal of Mathematical Psychology*, 38, 335-365.

Myung, I. J. (1994). Is the representation meaningful?: a measurement theoretic view. *Behavioral and Brain Sciences*, 17(4), 677-678. Commentary.

Myung, I. J., Colbert, C. M., & Levy, W. B. (1994). A computational hypothesis of probability inference in neural networks and some relations to psychological models. *Journal of Biological Systems*. 2(3), 367-384.

Busemeyer, J. R., Myung, I. J., & McDaniel M. A. (1993). Cue competition effects: empirical tests of adaptive network learning models. *Psychological Science*, 4(3), 190-195.

Busemeyer, J. R., Myung, I. J., & McDaniel M. A. (1993). Cue competition effects: theoretical implications for adaptive network learning models. *Psychological Science*, 4(3), 196-202.

Myung, I. J., and Busemeyer, J. R. (1992) Measurement free tests of a general state space model of prototype learning. *Journal of Mathematical Psychology*, 36(1), 32-67.

Busemeyer, J. R., and Myung, I. J. (1992) An adaptive approach to human decision making: learning theory, decision theory, and human performance. *Journal of Experimental Psychology: General*, 121(2), 177-194.

Myung, I. J., and Busemeyer, J. R. (1989) A state-space model for prototype learning. In G. Olson and E. Smith (Eds.), *Proceedings of the Eleventh Annual Meeting of the Cognitive Science Society*, pp. 50-57, Hillsdale, NJ: Erlbaum Associate.

Busemeyer, J. R., and Myung, I. J. (1989) An adaptive theory of human decision making. In D. Vickers and P. Smith (Eds.), *Human Information Processing: Measurements, Mechanisms, and Models*, pp. 461-469, XXIV International Congress of Psychology, North Holland.

Myung, I. J., and Busemeyer, J. R. (1989) Criterion learning in a deferred decision making task. *American Journal of Psychology*, 102, 1-16.

Busemeyer, J. R., and Myung, I. J. (1988) A new method for investigating prototype learning. *Journal of Experimental Psychology: Learning Memory and Cognition*, 14, 3-11.

Busemeyer, J. R., and Myung, I. J. (1987) Resource allocation decision making in an uncertain environment. *Acta Psychologica*, 66, 1-19.

MANUSCRIPTS UNDER REVIEW

Wu, H., Myung, J. I., & Batchelder, W. H. (submitted). Minimum description length model selection for multinomial processing tree models.

PROFESSIONAL ACTIVITIES

Editor-elect, *Journal of Mathematical Psychology*, 2010-2014

Guest Editor for a special *Journal of Mathematical Psychology* issue on model selection (vol. 44, 2000)

President, Society for Mathematical Psychology, 2001-2002

NIH grant review panel, Cognition and Perception Study Section, 2009-2013

NSF grant review panel, Methodology, Measurement and Statistics Section, 2001- 2003

NSF grant review panel (temporary), Perception, Action and Cognition Section, 2008

NIH grant review panel (temporary), Cognition and Perception Study Section, 2008

Organizing Committee member for the Psychonomic Symposium 'What Does It Mean to Model Cognition?' at Psychonomic annual meeting held in Minneapolis, MN on November 19, 2004

Organizing Committee member for the NIPS workshop 'Minimum Description Length' held at NIPS*2002 meeting on December 8, 2001

Organizing Committee member for the symposium 'Methods for Model Selection' held at Indiana University on August 3-4, 1997

Organizing Committee member for the workshop 'Topics in Mathematical Psychology' held at University of California, Irvine on July 6-26, 1997

PROFESSIONAL AFFILIATIONS

American Association for the Advancement of Science.

American Psychological Association

American Statistical Association

Cognitive Science Society

International Society for Bayesian Analysis

Psychonomic Society

Society for Mathematical Psychology

TEACHING EXPERIENCE

Graduate Statistics

Undergraduate Statistics

Connectionist Models in Psychology

Introduction to Cognitive Science

Bayesian Methods for Social & Behavioral Scientists

Research Methods in Psychology