
Richard L. Lewis

John R. Anderson Collegiate Professor of Psychology, Linguistics
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Research interests

Bounded rationality and optimality; psycholinguistics; artificial intelligence and reinforcement learning; decision making; cognitive architecture; working memory; sentence processing; linguistic theory; adaptive control; eye-movements; computational modeling.

Education

- 1993 Ph.D. in Computer Science, Carnegie Mellon University, Dec 1993. Thesis: *An Architecturally-based Theory of Human Sentence Comprehension*. Advisors: Allen Newell and Jill Lehman.
1987 B.S. in Computer Science, Summa Cum Laude, University of Central Florida, June 1987.

Academic positions

University of Michigan

- 2016– John R. Anderson Collegiate Professor of Psychology, Linguistics and Cognitive Science
2017–23 Director, Weinberg Institute for Cognitive Science
2007–16 Professor of Psychology & Professor of Linguistics (Cognition and Cognitive Neuroscience Area Chair, 2013–15)
2000–2007 Associate Professor of Psychology & Associate Professor of Linguistics

Princeton University

- 2024 C. V. Starr Faculty Fellow, Princeton Neuroscience Institute
1994–1995 McDonnell Postdoctoral Fellow in Psychology. Advisors: George Miller & Philip Johnson-Laird.

The Ohio State University

- 1995–2000 Assistant Professor of Computer and Information Science
1999–2000 Assistant Professor of Linguistics (courtesy appointment)

University of Potsdam, Germany

- 1999 Visiting Professor of Psychology

University of Freiburg, Germany

- 1996 Visiting Professor, Institute of Computer Science and Social Research

Honors

- 2024 C. V. Starr Faculty Fellow, Princeton Neuroscience Institute, 2024.
2022 Psychonomics Society Best Article Award, 2022.
2021 Best Student Paper (Advisor), Proceedings of the Workshop on Cognitive Modeling and Computational Linguistics, 2021.
John A. Swets Memorial Award for Excellence in Collaborative Research in Psychological Science, University of Michigan, 2021.
Arthur F. Thurnau Professor, University of Michigan, 2021.
2016 John R. Anderson Collegiate Professorship, University of Michigan, 2016.
2015 Best Paper Award, 14th International Conference on Autonomous Agents and Multiagent Systems, 2015.
2014 Best Student Paper (Advisor), Proceedings of the 5th Workshop on Cognitive Modeling and Computational Linguistics, 2014.
2010 Fellow, Association for Psychological Science, 2010.
2011 Honorary Faculty Member, Golden Key International Honour Society, University of Michigan Chapter, December 2011 (one of two UM faculty selected by students).
1997 Outstanding Teaching Award, Department of Computer and Information Science, Ohio State University, 1997.
1994–95 McDonnell Foundation Fellow in Psychology, Princeton University, 1994–95.
1988–91 National Science Foundation Graduate Fellowship, Carnegie Mellon University, 1988–91.

Teaching experience

Cognitive science, psycholinguistics, computational cognitive modeling, artificial intelligence, statistics for behavioral scientists.

Manuscripts under review

- 2026 Frankland, S. M., Marjeh, R., Nurisso, M., Fluegemann, J., Webb, T., Petri, G., Lewis, R. L., & Cohen, J. D. (2026). [Capacity Limits in Cognitive Processing Reflect the Curse of Generalization](#). Unpublished manuscript. Under review.
Hu, X., Angstadt, M., Storks, S., Huang, Z., Taxali, A., Weigard, A., Lewis, R. L., & Sripada, C. (2026). [Conflict and Congruency Effects in Large Language Models: In-Weight and In-Context Competition in a Verbal Conflict Task](#). Unpublished manuscript. Submitted.

Sripada, C., & Lewis, R. (2026). [Cognitive Convergence: Deep Similarities Between Large Language Models and Human Cognition](#). Unpublished manuscript. Submitted.

Publications

Refereed articles, chapters and volumes

- 2026 Nurisso, M., Fernando, J., Deshpande, R., Perotti, A., Marjeh, R., Frankland, S. M., Lewis, R. L., Webb, T. W., Campbell, D., Vaccarino, F., Cohen, J. D., & Petri, G. (2026). [Bound by semanticity: Universal laws governing the generalization-identification tradeoff](#). *Proceedings of the International Conference on Learning Representations*.
- Sripada, C., McInnerney, A., & Lewis, R. L. (2026). [Large language models illuminate the mechanistic underpinnings of the creative aspect of language use \(CALU\), long regarded as a mystery](#). *Behavioral and Brain Sciences*, 49, e221. Cambridge University Press.
- 2025 Fansher, M., Lalwani, P., Adkins, T. J., Zhang, H., Quirk, M., Carlson, M., Boduroglu, A., Lewis, R. L., Jonides, J., & Shah, P. (2025). [A brief intervention to improve reasoning about accumulation](#). *Journal of Experimental Psychology: Applied*, 31(2), 99–125. APA.
- Hu, X., & Lewis, R. L. (2025). [Do language models understand the cognitive tasks given to them? Investigations with the N-back paradigm](#). *Findings of the Association for Computational Linguistics*, 2665–2677.
- Munro, E. R., Koopman, S. E., Anderson, S. P., Schweller, K., Röhr, H., Kleiman-Weiner, M., Lewis, R. L., Klein, B., Allritz, M., Robinson, L. M., Dolins, F. L., & Call, J. (2025). [Chimpanzees \(Pan troglodytes\) and Bonobos \(Pan paniscus\) Chase Prey Around Obstacles in Virtual Environments](#). *Journal of Comparative Psychology*, 139(3), 155–177. APA.
- Ryu, S. H., & Lewis, R. L. (2025). [Memory for prediction: A Transformer-based theory of sentence processing](#). *Journal of Memory and Language*, 145, 104670. Elsevier.
- 2024 Hao, C., & Lewis, R. L. (2024). [Ethical Choice Reversals](#). *Cognitive Psychology*, 153, 101672. Elsevier.
- Walls, L., Lewis, R. L., & Howes, A. (2024). [Regret Theory Predicts Decoy Effects in Risky and Multiattribute Choice](#). *Proceedings of the Annual Meeting of the Cognitive Science Society*.
- 2023 Brooks, E. A., Walls, L., Lewis, R. L., & Singh, S. (2023). [Large Language Models can Implement Policy Iteration](#). *Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS 2023)*.
- Carvalho, W., Filos, A., Lewis, R. L., Lee, H., & Singh, S. (2023). [Composing Task Knowledge with Modular Successor Feature Approximators](#). *Proceedings of the International Conference on Learning Representations*.
- Carvalho, W., Saraiva, A., Filos, A., Lampinen, A. K., Matthey, L., Lewis, R., Lee, H., Singh, S., Rezende, D. J., & Zoran, D. (2023). [Combining behaviors with the successor features keyboard](#). *Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS 2023)*.
- Hu, X., Storks, S., Lewis, R. L., & Chai, J. (2023). [In-Context Analogical Reasoning with pre-Trained Language Models](#). *Proceedings of the Annual Meeting of the Association for Computational Linguistics*, 1953–1969.
- 2022 Adkins, T., Lewis, R., & Lee, T. (2022). [Heuristics contribute to sensorimotor decision-making under risk](#). *Psychonomic Bulletin & Review*, 29(1), 145–158. Springer US.
- Bornkessel-Schlesewsky, I., Sharrad, I., Howlett, C. A., Alday, P. M., Corcoran, A. W., Bellan, V., Wilkinson, E., Kliegl, R., Lewis, R. L., & Small, S. L. (2022). [Rapid Adaptation of](#)

- Predictive Models during Language Comprehension: Aperiodic EEG Slope, Individual Alpha Frequency and Idea Density Modulate Individual Differences in Real-Time Model Updating. *Frontiers in Psychology*, 13, 817516. Frontiers.
- Fansher, M., Adkins, T. J., Lalwani, P., Boduroglu, A., Carlson, M., Quirk, M., Lewis, R. L., Shah, P., Zhang, H., & Jonides, J. (2022). [Icon arrays reduce concern over COVID-19 vaccine side effects: A randomized control study.](#) *Cognitive Research: Principles and Implications*, 7(1), 1–9. 2022 Psychonomic Society Best Article Award.
- Fansher, M., Adkins, T. J., Lewis, R. L., Boduroglu, A., Lalwani, P., Quirk, M., Shah, P., & Jonides, J. (2022). [How well do ordinary Americans forecast the growth of COVID-19?](#) *Memory & Cognition*, 50(7), 1363–1380. Springer US.
- Hao, C., Cabrera-Haro, L. E., Lin, Z., Reuter-Lorenz, P. A., & Lewis, R. L. (2022). [Why do valence asymmetries emerge in value learning? A reinforcement learning account.](#) *Cognitive, Affective, & Behavioral Neuroscience*, 23(3), 543–556. Springer US.
- Jang, H., Lewis, R. L., & Lustig, C. (2022). [Opposite reactions to loss incentive by young and older adults: Insights from diffusion modeling.](#) *Psychology and Aging*, 37(4), 469. American Psychological Association.
- Zheng, Z., Vuorio, R., Lewis, R., & Singh, S. (2022). [Adaptive pairwise weights for temporal credit assignment.](#) *Proceedings of the AAAI Conference on Artificial Intelligence*, 9225–9232.
- 2021 Brooks, E. A., Rajendran, J., Lewis, R. L., & Singh, S. (2021). [Reinforcement Learning of Implicit and Explicit Control Flow in Instructions.](#) *Proceedings of the 38th International Conference on Machine Learning*.
- Carvalho, W., Liang, A., Lee, K., Sohn, S., Lee, H., Lewis, R., & Singh, S. (2021). [Reinforcement Learning for Sparse-Reward Object-Interaction Tasks in a First-person Simulated 3D Environment.](#) *Proceedings of the 30th International Joint Conference on Artificial Intelligence*.
- Ryu, S. H., & Lewis, R. L. (2021). [Accounting for agreement phenomena in sentence comprehension with transformer language models: Effects of similarity-based interference on surprisal and attention.](#) *Proceedings of the Workshop on Cognitive Modeling and Computational Linguistics*, 61–71. **Best Paper Award**
- Zheng, Z., Veeriah, V., Vuorio, R., Lewis, R. L., & Singh, S. (2021). [Learning State Representations from Random Deep Action-conditional Predictions.](#) *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS 2021)*.
- 2020 Gupta, A., Quinn, M., Saint, S., Lewis, R., Fowler, K. E., Winter, S., & Chopra, V. (2020). The variability in how physicians think: A casebased diagnostic simulation exercise. *Diagnosis*, 8(2), 167–175.
- Lewis, R. L., & Howes, A. (2020). [Cognitively Bounded Rational Analyses and the Crucial Role of Theories of Subjective Utility.](#) *Behavioral and Brain Sciences*, 43, e14.
- Momennejad, I., Lewis-Peacock, J., Norman, K. A., Cohen, J. D., Singh, S., & Lewis, R. L. (2020). [Rational use of episodic and working memory: A normative account of prospective memory.](#) *Neuropsychologia*, 158, 107657.
- Rajendran, J., Lewis, R., Veeriah, V., Lee, H., & Singh, S. (2020). [How Should an Agent Practice?.](#) *Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI)*.
- de los Santos, G., Boland, J. E., & Lewis, R. L. (2020). [Grammatical predictions in Spanish–English bilinguals and Spanish-language learners.](#) *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(5), 907. American Psychological Association.

- 2019 Cho, P. W., & Lewis, R. L. (2019). [A Modeling Study of the Effects of Surprisal and Entropy in Perceptual Decision Making of an Adaptive Agent](#). *Proceedings of the 9th Workshop on Cognitive Modeling and Computational Linguistics (CMCL 2019)*, 53-61.
- Langsford, S., Stephens, R. G., Dunn, J. C., & Lewis, R. L. (2019). [In Search of the Factors Behind Naive Sentence Judgments: A State Trace Analysis of Grammaticality and Acceptability Ratings](#). *Frontiers in Psychology*, 10, 2886. Frontiers.
- Veeriah, V., Hessel, M., Xu, Z., Rajendran, J., Lewis, R. L., Oh, J., van Hasselt, H. P., Silver, D., & Singh, S. (2019). [Discovery of useful questions as auxiliary tasks](#). *Advances in Neural Information Processing Systems*, 9306-9317.
- Zhang, Q., Lewis, R. L., Singh, S., & Durfee, E. (2019). [Learning to Communicate and Solve Visual Blocks-World Tasks](#). *Thirty-Third AAAI Conference on Artificial Intelligence (AAAI)*.
- 2018 Cho, P. W., Goldrick, M., Lewis, R. L., & Smolensky, P. (2018). [Dynamic encoding of structural uncertainty in gradient symbols](#). *Proceedings of the 8th Workshop on Cognitive Modeling and Computational Linguistics (CMCL 2018)*, 19-28.
- Howes, A., Chen, X., Acharya, A., & Lewis, R. L. (2018). [Interaction as an emergent property of a partially observable markov decision process](#). In *Computational Interaction* (Antti Oulasvirta and Per Ola Kristensson and Xiaojun Bi and Andrew Howes, Ed.), pp. 287-310. Oxford University Press.
- Howes, A., & Lewis, R. L. (2018). [The role of \(bounded\) optimization in theory testing and prediction](#). *Behavioral and Brain Sciences*, 41, e232. Cambridge University Press.
- Ke, A. H., Epstein, S. D., Lewis, R. L., & Pires, A. (2018). [The Quantificational Domain of dou: An Experimental Study](#). *Journal of Psycholinguistic Research*, 47(3), 537-556.
- 2017 Acharya, A., Chen, X., Myers, C. W., Lewis, R. L., & Howes, A. (2017). [Human Visual Search as a Deep Reinforcement Learning Solution to a POMDP](#). *Proceedings of the Annual Conference of the Cognitive Science Society*.
- 2016 Guo, X., Singh, S., Lewis, R. L., & Lee, H. (2016). [Deep Learning for Reward Design to Improve Monte Carlo Tree Search in ATARI Games](#). *25th International Joint Conference on Artificial Intelligence (IJCAI)*.
- Howes, A., Warren, P. A., Farmer, G., El-Dereby, W., & Lewis, R. L. (2016). [Why contextual preference reversals maximize expected value](#). *Psychological Review*, 123(4), 368-391.
- Patil, U., Vasishth, S., & Lewis, R. L. (2016). [Retrieval Interference in Syntactic Processing: The Case of Reflexive Binding in English](#). *Frontiers in Psychology*, 7, 329.
- 2015 Howes, A., Duggan, G. B., Kalidindi, K., Tseng, Y., & Lewis, R. L. (2015). [Predicting Short-Term Remembering as Boundedly Optimal Strategy Choice](#). *Cognitive Science*, 40(5), 1192-1223.
- Jiang, N., Kulesza, A., Singh, S., & Lewis, R. L. (2015). [The Dependence of Effective Planning Horizon on Model Accuracy](#). *14th International Conference on Autonomous Agents and Multiagent Systems (AAMAS2015)*. **Best Paper Award**.
- Oh, J., Guo, X., Lee, H., Lewis, R. L., & Singh, S. (2015). [Action-Conditional Video Prediction Using Deep Networks in Atari Games](#). *Advances in Neural Information Processing Systems (NIPS)*.
- 2014 Guo, X., Singh, S., Lee, H., Lewis, R. L., & Wang, X. (2014). [Deep Learning for Real-Time Atari Game Play Using Offline Monte-Carlo Tree Search Planning](#). *Advances in Neural Information Processing Systems (NIPS)*.
- Howes, A., Lewis, R. L., & Singh, S. (2014). [Utility Maximization and Bounds on Human Information Processing](#). *Topics in Cognitive Science*, 6(2), 198-203.

- Jian, N., Singh, S., & Lewis, R. L. (2014). [Improving UCT Planning via Approximate Homomorphisms](#). *Proceedings of the 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2014)*. Paris, France. International Foundation for Autonomous Agents and Multiagent Systems.
- Lewis, R. L., Howes, A., & Singh, S. (2014). [Computational Rationality: Linking Mechanism and Behavior Through Utility Maximization](#). *Topics in Cognitive Science*, 6(2), 279–311.
- Liu, B., Singh, S., Lewis, R. L., & Qin, S. (2014). [Optimal Rewards for Cooperative Agents](#). *IEEE Transactions on Autonomous Mental Development*, 6(4), 286–297.
- Shvartsman, M., Lewis, R. L., & Singh, S. (2014). [Computationally Rational Saccadic Control: An Explanation of Spillover Effects Based on Sampling from Noisy Perception and Memory](#). *Proceedings of the 5th Workshop on Cognitive Modeling and Computational Linguistics (CMCL 2014)*. Baltimore, MD. Association for Computational Linguistics. **Best Student Paper Award**.
- 2013 Feary, M., Billman, D., Chen, X., Howes, A., Lewis, R. L., Sherry, L., & Singh, S. (2013). [Linking context to evaluation in the design of safety critical interfaces](#). *Proceedings of Human-Computer Interaction International*.
- Guo, X., Singh, S., & Lewis, R. L. (2013). [Reward Mapping for Transfer in Long-lived Agents](#). *Advances in Neural Information Processing Systems 26 (NIPS)*.
- Lewis, R. L., Shvartsman, M., & Singh, S. (2013). [The adaptive nature of eye-movements in linguistic tasks: How payoff and architecture shape speed-accuracy tradeoffs](#). *Topics in Cognitive Science*, 5(3), 583–610.
- Myers, C. W., Lewis, R. L., & Howes, A. (2013). [Bounded Optimal State Estimation and Control in Visual Search: Explaining Distractor Ratio Effects](#). *Proceedings of the 35th Annual Meeting of the Cognitive Science Society*, 1049–1054.
- 2012 Bratman, J., Singh, S., Lewis, R. L., & Sorg, J. (2012). [Strong Mitigation: Nesting Search for Good Policies Within Search for Good Reward](#). *Proceedings of the 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2012)*.
- Liu, B., Singh, S., Lewis, R. L., & Qin, S. (2012). [Optimal rewards in multiagent teams](#). *Proceedings of the IEEE Conference on Development and Learning*. **Paper of Excellence Award**.
- 2011 Atkins, A. S., Berman, M. G., Reuter-Lorenz, P. A., Lewis, R. L., & Jonides, J. (2011). [Resolving semantic and proactive interference in memory over the short-term](#). *Memory & Cognition*, 39(5), 806–817.
- Bartek, B., Lewis, R. L., Vasishth, S., & Smith, M. R. (2011). [In search of on-line locality effects in sentence comprehension](#). *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 37(5), 1178–1198.
- Barto, A. G., Singh, S., & Lewis, R. L. (2011). [Intrinsically motivated machines](#). *Proceedings of the Fifteenth Yale Workshop on Adaptive and Learning Systems*, 123–129. Center for Systems Science, Department of Electrical Engineering, Yale University.
- Sorg, J., Singh, S., & Lewis, R. L. (2011). [Optimal rewards versus leaf-evaluation heuristics in planning agents](#). *Proceedings of AAAI-2011 (Conference of the Association for the Advancement Artificial Intelligence)*.
- Strohming, N., Lewis, R. L., & Meyer, D. E. (2011). [Divergent effects of different positive emotions on moral judgement](#). *Cognition*, 119(2), 295–300.
- 2010 Bratman, J., Shvartsman, M., Lewis, R. L., & Singh, S. (2010). [A new approach to exploring language emergence as boundedly optimal control in the face of environmental and](#)

- cognitive constraints. *Proceedings of the 10th International Conference on Cognitive Modeling*. To appear.
- Obata, M., Lewis, R. L., Epstein, S., Bartek, B., & Boland, J. (2010). [Featural analysis and short-term memory retrieval in on-line parsing: Evidence for syntactic, but not phonological, similarity-based interference](#). *Proceedings of NELS 41: Conference of the North East Linguistics Society*. Philadelphia.
- Singh, S., Lewis, R. L., Barto, A. G., & Sorg, J. (2010). [Intrinsically motivated reinforcement learning: An evolutionary perspective](#). *IEEE Transactions on Autonomous Mental Development*, 2(2), 70–82.
- Sorg, J., Singh, S., & Lewis, R. L. (2010). [Internal rewards mitigate agent boundedness](#). *International Conference on Machine Learning*. Haifa, Israel.
- Sorg, J., Singh, S., & Lewis, R. L. (2010). [Reward design via online gradient ascent](#). *Advances in Neural Information Processing Systems*.
- Sorg, J., Singh, S., & Lewis, R. L. (2010). [Variance-based rewards for approximate Bayesian reinforcement learning](#). *Proceedings of the 26th Conference on Uncertainty in Artificial Intelligence*. Also available at <http://event.cwi.nl/uai2010/>
- Vasishth, S., Suckow, K., Lewis, R. L., & Kern, S. (2010). [Short-term forgetting in sentence comprehension: Crosslinguistic evidence from verb-final structures](#). *Language and Cognitive Processes*, 25(4), 533–567.
- 2009 Berman, M. G., Jonides, J., & Lewis, R. L. (2009). [In search of decay in verbal short-term memory](#). *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 35(2), 317–333.
- Howes, A., Lewis, R. L., & Vera, A. H. (2009). [Rational adaptation under task and processing constraints: Implications for testing theories of cognition and action](#). *Psychological Review*, 116(4), 717–751.
- Lustig, C. A., Lewis, R. L., Berman, M. G., Nee, D. E., Moore, K. S., & Jonides, J. (2009). [Psychological and Neural Mechanisms of Short-term Memory](#). In *Handbook of Neuroscience for the Behavioral Sciences* (Berntson, G.G. and Cacioppo, J. T., Ed.). John Wiley.
- Marinier, R. P., Laird, J. E., & Lewis, R. L. (2009). [A computational unification of cognitive behavior and emotion](#). *Cognitive Systems Research*, 10(1), 48–69.
- Singh, S., Lewis, R. L., & Barto, A. G. (2009). [Where do rewards come from?](#). *Proceedings of the Annual Conference of the Cognitive Science Society*, 2601–2606. Amsterdam.
- 2008 Jonides, J., Lewis, R. L., Nee, D. E., Lustig, C. A., Berman, M. G., & Moore, K. S. (2008). [The mind and brain of short-term memory](#). *Annual Review of Psychology*, 59, 15.1–15.32.
- Smith, M. R., Lewis, R. L., Howes, A., Chu, A., Green, C., & Vera, A. (2008). [More than 8,192 Ways to Skin a Cat: Modeling Behavior in Multidimensional Strategy Spaces](#). *Proceedings of the 30th Annual Conference of the Cognitive Science Society*, 1441–1446. Austin, TX.
- Vasishth, S., Bruessow, S., Lewis, R. L., & Drenhaus, H. (2008). [Processing polarity: How the ungrammatical intrudes on the grammatical](#). *Cognitive Science*, 32(4), 685–712.
- 2007 Chu, A., Lewis, R. L., & Howes, A. (2007). [Evaluating the performance of optimizing constraint satisfaction techniques for cognitive constraint modeling](#). *The Proceedings of the 8th International Conference on Cognitive Modeling*, 26–31. Ann Arbor, Michigan. Psychology Press/Taylor & Francis.
- Howes, A., Lewis, R. L., & Vera, A. (2007). [Bounding rational analysis: Constraints on asymptotic performance](#). In *Integrated Models of Cognitive Systems* (Gray, W. D., Ed.). Oxford University Press.

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- Pearson, D., Gorski, N. A., Lewis, R. L., & Laird, J. E. (2007). [Storm: A Framework for biologically-inspired cognitive architecture research](#). *The Proceedings of the 8th International Conference on Cognitive Modeling*. Psychology Press/Taylor & Francis.
- 2006 Eng, K., Lewis, R. L., Tollinger, I., Chu, A., & Howes, A. (2006). [Generating automated predictions of behavior strategically adapted to specific performance objectives..](#) *Proceedings of the Computer-Human Interaction Conference, CHI 2006*. Best paper nomination: top 5 per cent of submissions.
- Lewis, R. L., Vasishth, S., & Van Dyke, J. A. (2006). [Computational principles of working memory in sentence comprehension](#). *Trends in Cognitive Sciences*, 10(10), 447–454. Elsevier.
- Nakayama, M., Vasishth, S., & Lewis, R. L. (2006). [Difficulty of certain sentence constructions in comprehension](#). In *Handbook of East Asian Psycholinguistics*. Cambridge University Press.
- Remington, R. W., Lewis, R. L., & Wu, S. (2006). [Scheduling mental operations in a multiple-response sequence: Modeling the effects of a strategy to minimize variance in the timing of saccades](#). In *Proceedings of the International Conference on Cognitive Modeling* (Fum, D. and Del Missier, F. and Stocco, A., Ed.), pp. 250–255. Edizioni Goliardiche.
- Ritter, F. E., Haynes, S. R., Cohen, M., Howes, A., John, B., Best, B., Lebiere, C., Jones, R. M., Crossman, J., Lewis, R. L., St. Amant, R., McBride, S. P., Urbas, L., Leuchter, S., & Vera, A. (2006). [High-level behavior representation languages revisited](#). In *Proceedings of the International Conference on Cognitive Modeling (ICCM)* (Fum, D. and Del Missier, F. and Stocco, A., Ed.). Edizioni Goliardiche.
- Vasishth, S., & Lewis, R. L. (2006). [Argument-head distance and processing complexity: Explaining both locality and anti-locality effects](#). *Language*, 82(4), 767–794.
- Vasishth, S., & Lewis, R. L. (2006). [Symbolic models of human sentence processing..](#) In *Encyclopedia of Language and Linguistics, 2nd edition* (Brown, K., Ed.), pp. 410–419. Elsevier.
- Wu, S., Remington, R. W., & Lewis, R. L. (2006). [Modeling the scheduling of eye movements in performing a sequence of discrete tasks](#). In *Proceedings of the Cognitive Science Society*.
- 2005 Howes, A., Lewis, R. L., Vera, A., & Richardson, J. (2005). [Information-requirements grammar: A theory of the structure of competence for interaction](#). *Proceedings of the Cognitive Science Society*. Stresa, Italy.
- Lewis, R. L., & Vasishth, S. (2005). [An activation-based model of sentence processing as skilled memory retrieval](#). *Cognitive Science*, 29(3), 375–419. Wiley Online Library.
- Nakayama, M., Lee, S., & Lewis, R. L. (2005). [Difficulty of processing Japanese and Korean center-embedding constructions](#). In *Studies in Language Sciences* (Masahiko Minami and Harumi Kobayashi and Mineharu Nakayama and Hidetosi Sirai, Ed.), pp. 99–118. Kurosio Publishers.
- Tollinger, I., Lewis, R. L., McCurdy, M., Tollinger, P., Vera, A., Howes, A., & Pelton, L. (2005). [Supporting efficient development of cognitive models at multiple skill levels: Exploring recent advances in constraint-based modeling](#). *Proceedings of the Computer-Human Interaction Conference*. Portland, Ore.. Best paper nomination: top 5 per cent of submissions.

- Vannest, J., Polk, T. A., & Lewis, R. L. (2005). [Dual-route processing of complex words: new fMRI evidence from derivational suffixation](#). *Cognitive, Affective, and Behavioral Neuroscience*, 5(1), 67–76.
- Vasishth, S., Drenhaus, H., Saddy, D., & Lewis, R. L. (2005). [Processing Negative Polarity](#). *Proceedings of the CUNY Sentence Processing Conference*. University of Arizona.
- Vera, A. H., Howes, A., Lewis, R. L., Tollinger, I., Eng, K., & Richardson, J. (2005). [A constraint-based approach to understanding the composition of skill](#). *Proceedings of the Human-Computer Interaction 2005 Symposium*, Las Vegas.
- Vera, A. H., Tollinger, I., Eng, K., Lewis, R. L., & Howes, A. (2005). [Architectural building blocks as the locus of adaptive behavior selection](#). *Proceedings of the Cognitive Science Society*. Stresa, Italy.
- 2004 Howes, A., Vera, A., Lewis, R. L., & McCurdy, M. (2004). [Cognitive constraint modeling: A formal approach to supporting reasoning about behavior](#). *Proceedings of the Cognitive Science Society*. Chicago.
- Lewis, R. L., Vera, A., & Howes, A. (2004). [A constraint-based approach to understanding the composition of skill](#). *Proceedings of the International Conference on Cognitive Modeling*.
- Simen, P., Polk, T. A., Lewis, R. L., & Freedman, E. (2004). [A computational account of latency impairments in problem solving by Parkinson's patients](#). *Proceedings of the International Conference on Cognitive Modeling*.
- Vasishth, S., & Lewis, R. L. (2004). [Modeling sentence processing in ACT-R](#). *Proceedings of the Association for Computational Linguistics*. Barcelona.
- Vera, A., Howes, A., McCurdy, M., & Lewis, R. L. (2004). [A constraint-satisfaction approach to predicting skilled interactive cognition](#). *Proceedings of the Computer-Human Interaction Conference CHI-2004*. Vienna, Austria.
- 2003 Lewis, R. L. (2003). [Computational Psycholinguistics](#). In *Encyclopedia of Cognitive Science*. Macmillan (Nature Publishing Group).
- Simen, P., Polk, T. A., & Lewis, R. L. (2003). [Universal computation by networks of model cortical columns](#). *Proceedings of the International Conference on Cognitive Modeling (ICCM)*.
- Van Dyke, J. A., & Lewis, R. L. (2003). [Distinguishing effects of structure and decay on attachment and repair: A cue-based parsing account of recovery from misanalyzed ambiguities](#). *Journal of Memory and Language*, 49(3), 285–316. CiteSeer.
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- 2001 Lewis, R. L. (2001). [Cognitive Theory, Soar](#). In *International Encyclopedia of the Social and Behavioral Sciences*, pp. 2178–2183. Pergamon (Elsevier Science).
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- 1998 Lehman, J. F., Newell, A., & Lewis, R. L. (1998). [Architectural Influences on Language Comprehension](#). In *Constraining Cognitive Theorie: Issues and Options* (Pylyshyn, Zenon W., Ed.). Ablex Press.
- Lewis, R. L. (1998). [Leaping off the garden path: Reanalysis and limited repair parsing](#). In *Reanalysis in Sentence Processing* (Fodor, Janet and Ferreira, Fernanda, Ed.), pp. 247–285. Kluwer Academic.
- 1996 Lewis, R. L. (1996). [Architecture Matters: What Soar has to say about modularity](#). In *Mind Matters: Contributions to Cognitive and Computer Science in Honor of Allen Newell* (Steier, D. and Mitchell, T., Ed.). Erlbaum.
- Lewis, R. L. (1996). [Interference in short-term memory: The magical number two \(or three\) in sentence processing](#). *Journal of Psycholinguistic Research*, 25(1), 93–115. Springer.
- Vera, A. H., & Lewis, R. L. (1996). [Dissociating performance from learning: An empirical evaluation of a computational model](#). *Proceedings of the Eighteenth Annual Conference of the Cognitive Science Society*.
- 1994 Lewis, R. L. (1994). [Task specification language, or theory of human memory?](#). *Behavioral and Brain Sciences*, 17(4), 67–75.
- Lewis, R. L., & Vera, A. H. (1994). Non-declarative learning in an interactive task. *CHI '94 Research Symposium*.
- 1993 Lehman, J. F., Newell, A., Polk, T. A., & Lewis, R. L. (1993). The Role of Language in Cognition: A Computational Inquiry. In *Conceptions of the Human Mind* (Harman, G., Ed.). Erlbaum.
- Lewis, R. L. (1993). [An architecturally-based theory of sentence comprehension](#). *Proceedings of the Fifteenth Annual Conference of the Cognitive Science Society*, 108–113.
- Lewis, R. L. (1993). [An Architecturally-based theory of Human Sentence Comprehension](#). Doctoral dissertation, Carnegie Mellon University.
- Steier, D. M., Lewis, R. L., Lehman, J. F., & Zacherl, A. L. (1993). [Combining multiple sources of knowledge in an integrated intelligent system](#). *IEEE Expert*, 8(3), 3–4.
- Vera, A. H., Lewis, R. L., & Lerch, F. J. (1993). [Situating decision-making and recognition-based learning: Applying symbolic theories to interactive tasks](#). *Proceedings of the Fifteenth Annual Conference of the Cognitive Science Society*.
- 1991 Lehman, J. F., Lewis, R. L., & Newell, A. (1991). [Integrating knowledge sources in language comprehension](#). *Proceedings of the Thirteenth Annual Conference of the Cognitive Science*

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- 1990 Lewis, R. L., Huffman, S. B., John, B. E., Laird, J. E., Lehman, J. F., Newell, A., Rosenbloom, P. S., Simon, T., & Tessler, S. G. (1990). [Soar as a Unified Theory of Cognition: Spring 1990](#). *Proceedings of the Twelfth Annual Conference of the Cognitive Science Society*, 103–042. Also in P. S. Rosenbloom, J. E. Laird, and A. Newell, eds., *The Soar Papers: Research on Integrated Intelligence*, MIT Press, Cambridge, MA, 1993.
- 1989 Lewis, R. L., Newell, A., & Polk, T. A. (1989). [Toward a Soar theory of taking instructions for immediate reasoning tasks](#). *Proceedings of the Eleventh Annual Conference of the Cognitive Science Society*, 514–521. Also in P. S. Rosenbloom, J. E. Laird, and A. Newell, eds., *The Soar Papers: Research on Integrated Intelligence*, MIT Press, Cambridge, MA, 1993.
- Polk, T. A., Newell, A., & Lewis, R. L. (1989). [Toward a unified theory of immediate reasoning in Soar](#). *Proceedings of the Eleventh Annual Conference of the Cognitive Science Society*, 50–13. Also in P. S. Rosenbloom, J. E. Laird, and A. Newell, eds., *The Soar Papers: Research on Integrated Intelligence*, MIT Press, Cambridge, MA, 1993.
- 1988 Moshell, J. M., Hughes, C. E., Lacy, L. W., Lewis, R. L., & Blower, D. (1988). Action graphics: An interactive spreadsheet-based animation system for simulation and training. *Proceedings of the Simulators V Conference*, 47–78. The Society for Computer Simulation International.
- 1987 Moshell, J. M., Hughes, C. E., Lacy, L. W., Lewis, R. L., & Blower, D. (1987). An educational animation system based on class inheritance. *Proceedings of the Conference of the National Computer Graphics Association*, 59–62.
- Moshell, J. M., Hughes, C. E., Lacy, L. W., Lewis, R. L., & Blower, D. (1987). A spreadsheet-based visual language for freehand sketching of complex motions. *Proceedings of the 1987 Workshop on Visual Languages*.

Technical reports and unpublished manuscripts

- 2010 Lewis, R. L. (2010). [Efficiency, Economy, Optimality, Simplicity, Minimality, Search, Mapping, Function, State: An Attempt at Clarifying Definitions](#). Unpublished manuscript.
- Lewis, R. L. (2010). [The Strong Minimalist Thesis and Bounded Optimality](#). Unpublished manuscript. University of Michigan.
- 1992 Lewis, R. L. (1992). [Recent developments in the NL-Soar garden path theory](#). Technical Report CMU-CS-92-14, School of Computer Science, Carnegie Mellon University.
- 1987 Lewis, R. L. R. L., Hughes, C. E., Lacy, L. W., & Moshell, J. M. (1987). CFCL: Central Florida Common Lisp Object System. Department of Computer Science, The University of Central Florida.
- 1986 Moshell, J. M., & Lewis, R. L. (1986). The Action Graphics freehand animation system. Department of Computer Science, The University of Central Florida.

Local academic and administrative service

Intra-departmental service (University of Michigan)

- Department of Psychology Annual Review Committee.
- 2021–22 Department of Psychology Search Committee Chair, 2021–22.
- 2016–2020 Faculty lead, East Hall 2nd Floor research space renovation planning, 2016–2020.
- 2017 Department of Psychology Space Committee Chair, 2017.
- 2013–15 Area chair, Cognition and Cognitive Neuroscience, 2013–15.
- Department of Psychology Executive Committee.
- Department of Psychology Augmented Executive Committee.
- Department of Psychology Statistics Task Force.
- Department of Psychology Undergraduate Studies Committee.
- Department of Psychology Web Task Force.
- Department of Psychology Promotion and Tenure Committees (multiple).
- Department of Psychology Space and Facilities Committee.
- Department of Psychology Search Committees (multiple, including Cognition and Cognitive Neuroscience, Biopsychology, Quantitative, Psycholinguistic).
- Cognition and Cognitive Neuroscience Admissions Chair.
- Cognition and Cognitive Neuroscience Forum Committee Chair.
- Cognition and Cognitive Neuroscience Recruitment Chair.

Cognitive Science initiatives (University of Michigan)

- 2017–23 Director, Weinberg Institute for Cognitive Science, 2017–23.
- 2022–23 Co-Chair of College of LSA Cognitive Science Advisory Group, 2022–23.
- 2010 Member of Cognitive Science Task Force (predecessor to the undergraduate major, grad certificate, and Weinberg Institute committees), 2010.
- 2011–13 Member of committee to develop the Cognitive Science Undergraduate Concentration, and one of chief architects of the proposal, 2011–13.
- 2009–15 Member of committee to develop the Cognitive Science Graduate Certificate, and one of chief architects of the proposal, 2009–15.
- 2014–15 Founding member of the Weinberg Institute for Cognitive Science Executive Committee, 2014–15.
- Founding member of the Cognitive Science Undergraduate Major Steering Committee (at 62 majors after 1 year), 2014–15.
- 2012–13 Lead organizer of the Weinberg Cognitive Science Symposium on *Rationality and its Bounds*, 2012–13.
- 2014–15 Member of organizing committee for Weinberg Cognitive Science Symposium on *The Cognitive Science of Moral Minds* (2014–15), the inaugural event for the Weinberg Institute.
- 2011–15 Developer of new Introduction to Cognitive Science gateway course for the new undergraduate major, taught now five times (including two pilots) to over 600 students, with instructor ratings 4.7–4.9/5, 2011–15.

Other cross-department/college service (University of Michigan)

- 2025–26 Member, Grievance Hearing Board (2025–26).
- 2020–21 Member, LSA Computing Education Task Force (2020–21).
- 2012 Member of steering committee for 2012 LSA Theme Semester on *Language: The Human Quintessence*.
- 2004–06 Member of committee to develop Language & Mind subconcentration in Department of Linguistics; committee received a Whitaker Grant for the Development of Undergraduate Education (2004–06).
- 2007–09 Steering committee for Center for Cognitive Architecture (2007–09).
- 2006–07 LS&A Information Technologies Committee (2006–07).
- Promotion and tenure committees for Department of Linguistics (multiple).
- Thesis committee member for Department of Linguistics (multiple).
- Thesis committee member/co-chair for Department of Electrical Engineering and Computer Science (multiple).
- Thesis committee member for Department of Philosophy (2).

External professional service

Reviewing service for other institutions

- 2024– External advisory board for *Johns Hopkins University Department of Cognitive Science*, 2024–.
- 2023 External review committee for *Johns Hopkins University Department of Cognitive Science*, Fall 2023.
- 2013 External review committee for *Rice University Department of Psychology*, Fall 2013.
- Multiple external promotion and tenure cases (including *Princeton University*, *University of Chicago*, *Purdue University*, *Tufts University*, *University of California, San Diego*, *University of Southern California*, *University of Washington*, *University of Illinois*, *Rice University*, *Manchester University*, *University of Massachusetts*, *Ohio State University*, *Northwestern University*, *York University*...).
- 2014–2018 National Science Foundation (including College of Reviewers for the Perception, Action and Cognition Program, 2014–2018).
- Air Force Office of Research.
- Office of Naval Research.
- National Institutes of Health.

Journal boards

- 2011–15 *Psychological Review*, editorial board, 2011–15.
- 2006–2008 *Language Learning*, editorial board, 2006–2008.
- 2001–2006 *Cognitive Science*, board of reviewers, 2001–2006.

Reviewing service

AMLAP (Architectures and Mechanisms for Language Processing Conference)

AAAI (National Conference on Artificial Intelligence)

Cambridge University Press

Cognition

Cognitive Psychology

Cognitive Science

Cognitive, Affective, and Behavioral Neuroscience

Cognitive Science Society

CUNY Sentence Processing Conference

International Conference on Cognitive Modeling (ICCM)

Kluwer Academic Publishers

Language and Cognitive Processes

Language Learning

Journal of Experimental Psychology: Learning, Memory & Cognition

Journal of Memory and Language

Journal of Psycholinguistic Research

Oxford University Press

Proceedings of the National Academy of Sciences

Psychological Review

Psychological Science

Psychonomic Bulletin & Review

Wiley Interdisciplinary Reviews: Cognitive Science

Conferences and workshops organized

- 2024 Local co-organizer, Annual Conference on Human Sentence Processing (HSP2024), May 2024, Ann Arbor.
- 2017 Local co-organizer, Third Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM-2017), June 11–14, 2017, Ann Arbor.
- 2007 Local co-organizer, International Conference on Cognitive Modeling, July 24–27, 2007, Ann Arbor.
- 1998 Workshop on Reanalysis in Sentence Processing, March 18, 1998, New Brunswick, NJ.
- 1997 17th North American Soar Workshop, June 27–29, 1997, Columbus, Ohio.

Invited presentations

- 2026 A Surprising Consilience of Chomskyan Linguistics and Artificial Intelligence. *The First Workshop on Generative Linguistics and Music*, Ann Arbor, March, 2026.
- 2025 Patterns of Thought: The story of artificial intelligence, and a revolution in our understanding of the human mind. *KLA Corporation*, Ann Arbor, October, 2025.
Patterns of Thought: The story of artificial intelligence, and a revolution in our understanding of the human mind. *Exploring the Mind Series*, Ann Arbor Public Library, Ann Arbor, September, 2025.
- 2024 Learning to Parse, Parsing to Learn, and the Proper Treatment of Ideas and People. *Memorial Workshop Celebrating Janet Fodor at the Annual Meeting of the Human Sentence Processing Society*, Ann Arbor, May, 2024.

- The Advent of Artificial Intelligence: What Does it Mean for Psychology, Linguistics and Cognitive Science? *Inaugural John R. Anderson Collegiate Professorship Lecture, University of Michigan*, March, 2024.
- 2023 Memory for Prediction: Transformer Language Models as Theories of Human Sentence Processing. *Neuroscience Institute, Princeton University*, December, 2023.
- Memory for Prediction: Transformers as Theories of Human Sentence Processing. *Department of Language Sciences, University of California, Irvine*, November, 2023.
- 2021 Transformer Language Models as Psycholinguistic Theories. *Department of Linguistics, University of Chicago*, May, 2021.
- 2019 Boundedly Rational Language, Choice and Action and the Prospects for Theoretical Cognitive Science in the Age of Deep Learning. *Cognitive Science Colloquium, University of Maryland*, November, 2019.
- The Neurocognitive Interface Between Syntax and Domain-General Processing Systems. *Brain and Syntax Workshop, Northwestern University*, October, 2019.
- Bounded Rationality: Computationally Rational Choice, Action and Reward. *Graded Symbolic Computation Workshop, Johns Hopkins University*, October, 2019.
- 2018 Bounded Rationality: Computationally Rational Choice, Action and Reward. *Distinguished Cognitive Science Colloquium, Michigan State University*, October, 2018.
- Optimal Rewards for Bounded Agents. *DARPA Workshop on Intrinsically Motivated Artificial Intelligence, Arlington, VA*, June, 2018.
- 2017 The Shared Frontiers of Artificial Intelligence and Cognitive Science. *University of Central Florida, Symposium on Machine and Human Learning*, December, 2017.
- Rethinking Bounded Rationality. *University of Adelaide, Department of Psychology*, March, 2017.
- The Challenge of Understanding Language and Executive Functions. *Massachusetts Institute of Technology, Brain and Cognitive Sciences, Workshop on Language and Executive Function*, May, 2017.
- 2016 Computationally Rational Language Processing and Language Design. *Northwestern University, Department of Linguistics Colloquium*, October, 2016.
- Rethinking Bounded Rationality: Computationally Rational Choice, Action, and Reward. *University of Washington, Allen L. Edwards Lectureship in Psychology*, May, 2016.
- Computational Rationality in Minds and Machines. *Microsoft Research, Redmond, Washington*, March, 2016.
- Computational Rationality and Choice. *The Origins and Future of Pattern Processing and Intelligence: From Brains to Machines. The Origins Project, Arizona State University, Tempe*, March, 2016.
- 2015 Combining Bounds and Rational Analysis for Explanation in Cognitive Science. *Workshop on Bounded Rationality, NIPS 2015 (Neural Information Processing Conference), Montreal*, December, 2015.
- Computational Rationality: Three Vignettes. *Drexel University, Department of Psychology Colloquium*, March, 2015.
- 2014 Integrating the Continuous & Discrete Over Time: Theoretical and Empirical Challenges in Understanding the Sequential Dynamics of Sentence Processing. *Gradient Symbolic Computation Workshop: The Continuous and Discrete in Sentence Processing, Johns Hopkins University*, November, 2014.

- What Are Boundedly Rational Mechanisms for Language, Perception, and Action? *Johns Hopkins University, Departments of Computer Science and Cognitive Science Colloquium*, October, 2014.
- What Are Rational Mechanisms for Language, Perception, and Action? *Saarland University, Computational Linguistics Colloquium*, January, 2014.
- 2013 Language as a Computationally Rational Response Function. *AAAI Fall Symposium on Integrated Cognition*, November, 2013.
- What Does Integrated Cognition Theory Look Like? *AAAI Fall Symposium on Integrated Cognition*, November, 2013.
- Optimal Control Approaches to Language Processing. Keynote presentation at *Cognitive Modeling and Computational Linguistics (CMCL-2013)*, Sofia, Bulgaria, August, 2013.
- 2012 Combining Optimal Control and Estimation with Theories of Cognitive Architecture. *Chief Scientist's Colloquium Series*, Air Force Research Labs, Wright Patterson Air Force Base, Dayton, Ohio, August, 2012.
- Human Behavior as an Adaptation to Mental Architecture. *Reinforcement Learning Symposium* (celebrating Andrew Barto's retirement), University of Massachusetts, July, 2012.
- Optimal Control Approaches to Language. *University of Maryland Linguistics MayFest*, May, 2012.
- Short-term Memory and Optimal Discrimination in Sentence Processing. *30th European Workshop on Cognitive Neuropsychology*, January, 2012.
- 2011 Similarity-based Interference and Optimal Discrimination in Sentence Processing. *SUNY Stony Brook, Linguistics Colloquium*, November, 2011.
- A Cue-based Retrieval Theory of Working Memory in Language Processing: Core Computational Principles and Implications for Individual Differences. *Academy of Aphasia*, Montreal, October, 2011.
- Bounded Optimality in Language, Thought and Action. *SUNY Buffalo, Cognitive Science Colloquium*, March, 2011.
- Bounded Optimality in Language, Thought and Action. *Michigan State University, Linguistics Colloquium*, February, 2011.
- 2010 Where Do Rewards Come From? *Symposium on AI-Inspired Biology* (held at the *Thirty Sixth Annual Convention of the Society for the Study of Artificial Intelligence and Simulation of Behaviour*), Leicester, UK, March, 2010.
- Bounded Optimality in Language and Action: Rational Behavior Under Cognitive Constraint. *University of Arizona*, February, 2010.
- 2009 Short-term Memory in Language and its Adaptive Control. *Cognitive Science Conference Symposium on Language and Memory*, Amsterdam, July, 2009.
- Cognitively Bounded Rational Analysis and Optimal Control. *International Conference on Cognitive Modeling Symposium on Rational Explanations*, Manchester, July, 2009.
- Adaptive Control of Language and Action: Boundedly Rational Behavior Under Cognitive Constraint. *University of Potsdam, Germany*, January, 2009.
- 2008 The Adaptive Nature of Human Performance: Models of Boundedly Rational Control. *Air Force Research Labs, Mesa, Arizona*, December, 2008.
- The Surprising Nature of Working Memory in Language Comprehension. Keynote Address, *COGFEST-2008, The Ohio State University*, May, 2008.

- 2007 Deriving a Theory of Verb-final Processing: The Adaptive Control of Working Memory. *Max Planck Institute for Human Cognitive and Brain Science*, Leipzig, Germany, December, 2007.
- The Surprising Nature of Working Memory in Language Comprehension. Department of Psychology, *Rice University*, April, 2007.
- 2006 The Surprising Nature of Working Memory in Language Comprehension. Department of Linguistics, *University of Maryland*, April, 2006.
- The Surprising Nature of Working Memory in Language Comprehension. Keynote Address, *International Conference on Cognitive Modeling*, Trieste, Italy, April, 2006.
- 2005 Explaining the Bounds on the Adaptation of Skilled Interactive Behavior. Center for Human-Machine Interaction, *Berlin Technical University*, December, 2005.
- Toonology: The New Yorker Cartoon Meets Modern Psychological Science. *General Motors Warren R&D Center*, September, 2005.
- Toonology: Modern Science meets the New Yorker Cartoon. *National Alliance for the Mentally Ill of Washtenaw County*, Annual Meeting, June, 2005.
- 2004 Sentence Processing as Skilled Memory Retrieval. *University of Potsdam*, Germany, December, 2004.
- Sentence Processing as Skilled Memory Retrieval. *NASA Ames Research Center*, Cognitive Group, December, 2004.
- Sentence Processing as Skilled Memory Retrieval. Rumelhart Award Symposium, *Cognitive Science Conference*, Chicago, August, 2004.
- 2003 Parsing as Working Memory Retrieval. Workshop on Computational Models of Sentence Processing, *University of the Saarland*, Germany, July, 2003.
- Scalable Cognitive Modeling Through Compositional Reuse. *Office of Naval Research Conference on Affordable Human Behavior Modeling*, Arlington, VA. With John, B. E., Lewis, R. L., Matessa, M., Remington, R., Vera, A. April, 2003.
- Learning in ACT-R: Chunking Revisited. Symposium on Advances in Cognitive Architectures, *Stanford University*, March, 2003.
- Parsing as Working Memory Retrieval. Department of Cognitive Science, *Johns Hopkins University*, February, 2003.
- 2002 Parsing as Memory Retrieval. TEAP-2002 Tagung Experimental Arbeitender Psychologen, *Chemnitz*, special session on Dynamical Models of Language Processing, March, 2002.
- Parsing as Memory Retrieval. Institute for Research in Cognitive Science, *University of Pennsylvania*, March, 2002.
- 2001 Toward Detailed Models of Sentence Processing Constrained by ERP Data. Workshop on Analyzing and Modelling Event-Related Brain Potentials: Cognitive and Neural Approaches, *Potsdam University*, Germany, November, 2001.
- Does the Mind Need a Bottleneck? Toward a functional analysis of bottlenecks, executive processes, and control structure. *NASA Ames Research Center*, Cognitive Group, November, 2001.
- ACT-R and Language Processing: Opportunities, Challenges, and the Linguistic Killer Bees. *ACT-R Post-Graduate Summer School*, July, 2001.
- Building a UTC from the top-down: What cognitive architectures might have to offer theories of executive function in cognitive neuroscience. Soar Workshop 21, *University of Michigan*, May, 2001.

- Working Memory for Syntactic Processing: Serial Order Information and Cue-based Retrieval. Department of Psychology, *Michigan State University*, February, 2001.
- 2000 A Theory of Short-Term Memory Retrieval in Sentence Processing. Institute of Cognitive Science, *University of Louisiana at Lafayette*, October, 2000.
- Sentence Processing as Memory Retrieval: A Computational Model of Race-based Parsing in a Limited Working Memory. Language Technologies Institute, School of Computer Science, *Carnegie Mellon University*, February, 2000.
- A Theory of Short-Term Memory Retrieval in Sentence Processing. Department of Psychology, *Carnegie Mellon University*, February, 2000.
- Sentence Processing as Memory Retrieval: A Computational Model of Race-based Parsing in a Limited Working Memory. Department of Psychology, *University of Michigan*, February, 2000.
- A Theory of Short-Term Memory Retrieval in Sentence Processing. Department of Psychology, *University of Michigan*, February, 2000.
- 1999 In Search of Fully Lexical Parsing. Department of Psychology, *Potsdam University*, December, 1999.
- Determinants of Processing Complexity in Japanese: New Theory and Data. (with Mineharu Nakayama) *International East Asian Psycholinguistics Workshop*, *Ohio State University*, July, 1999.
- Computational and Psychological Foundations of Sentence Processing. Seminar at Departments of Psychology and Linguistics, *Potsdam University*, June, 1999.
- What Will It Take to Determine Whether Human Parsing is Serial or Parallel? *The CUNY Sentence Processing Conference*, New York City, March, 1999.
- 1998 Sentence Comprehension with Limited Working Resources: Cognitive and Computational Foundations. Department of Psychology, *Carnegie Mellon University*, December 9, 1998.
- Limited Repair Parsing. *Workshop on Reanalysis in Sentence Processing*, New Brunswick, NJ, March 18, 1998.
- 1997 Interference in Working Memory: The Magical Number Two or Three in Sentence Comprehension. Department of Psychology and Cognitive Science Center, *Hong Kong University*, November 26, 1997.
- A Soar Perspective on Working Memory. (With Richard Young) *Symposium on Models of Working Memory*, *University of Colorado, Boulder*, July 10, 1997.
- Interference in Working Memory: The Magical Number Two in Sentence Processing. *Symposium for Computational and Neural Bases of Language*, *University of Michigan Psychology Department*, Ann Arbor, May 16, 1997.
- 1996 Computational Architectures for Human Sentence Processing. Seminar course presented at the Institute for Computer Science and Social Research, *University of Freiburg*, Germany, December 17–19, 1996.
- Identifying Cognitive Architectures and Their Programs. Department of Psychology, *University of Freiburg*, Germany, December 18, 1996.
- Uncovering the Architecture of Sentence Comprehension: Powerful Processing with Limited Working Memory. Department of Computational Linguistics, *University of the Saarland*, Germany, December 16, 1996.
- An introduction to the Soar cognitive architecture. Institute for Artificial Intelligence, *University of the Saarland*, Germany, December 16, 1996.

- Uncovering the Architecture of Sentence Comprehension: Powerful Processing with Limited Working Memory. Center for Cognitive Science, *University of Freiburg*, Germany, December 17, 1996.
- Uncovering the Architecture of Sentence Comprehension: Powerful Processing with Limited Working Memory. Department of Psychology, *University of Michigan*, Ann Arbor, November 13, 1996.
- Architectural requirements for intelligence and language processing: A Soar-based perspective. *Conference on Intelligent systems: A Semiotic Perspective, National Institute of Standards and Technology (NIST)*, Gaithersburg, MD, October 20–23, 1996.
- A Theory of the Architecture of Sentence Comprehension. Department of Electrical Engineering and Computer Science, *University of Michigan*, Ann Arbor, February 20, 1996.
- 1995 Interference in Short-term Memory: The Magical Number Two in Sentence Processing. Interdisciplinary Center for Cognitive Studies, *University of Potsdam*, Germany, October 14, 1995.
- Identifying Cognitive Architecture. Interdisciplinary Center for Cognitive Studies, *University of Potsdam*, Germany, October 13, 1995.
- A Theory of the Architecture of Sentence Comprehension. *Rutgers University Center for Cognitive Science*, New Brunswick, New Jersey, April 25, 1995.
- A Theory of the Architecture of Sentence Processing. Departments of Psychology and Linguistics, *University of Massachusetts*, Amherst, April 17, 1995.
- Simple Destructive Repair: A Theory of Revision in Parsing. Department of Linguistics, *City University of New York*, April 5, 1995.
- 1994 Building psychological theories with cognitive architectures. Cognitive Architectures Workshop, Interdisciplinary Center for Cognitive Studies, *University of Potsdam*, Germany, July 8–11, 1994.
- 1993 An Architecturally-based Theory of Human Sentence Comprehension. Plenary Symposium in Honor of Allen Newell, *Fifteenth Cognitive Science Conference*, Boulder, Colorado, June 19, 1993.
- An Architecturally-based Theory of Human Sentence Comprehension. The Cognitive Science Laboratory, *Princeton University*, March 29, 1993.
- 1992 Architecture Matters. *The Mind Matters Symposium in Honor of Allen Newell*, *Carnegie Mellon University*, Pittsburgh, October 26, 1992.
- 1991 Language Comprehension in a Continuously Learning Integrated Architecture. Computer Science Department, *University of Central Florida*, Orlando, June 24, 1991.
- NL-Soar as a Cognitive Model. *Fourth European Workshop on Soar*, *Twente University*, Enschede, The Netherlands, January, 1991.
- 1989 NL-Soar: Language Comprehension in Soar. *European Soar Workshop and Tutorial*, *The University of Groningen*, The Netherlands, June 19, 1989.

Conference presentations (not listed above in publications)

- 2012 Shvartsman, M., Lewis, R. L. and Singh, S. (March 2012) *The Adaptive Nature of Eye-movement Control in Linguistics Tasks*. In *Proceedings of the CUNY Sentence Processing Conference*. New York, NY.
- 2011 Patil, U., Vasishth, S. and Lewis, R. L. (March 2011) *Early retrieval interference in syntax-guided antecedent search*. In *Proceedings of the CUNY Sentence Processing Conference*. Stanford, CA.

- Shvartsman, M., Lewis, R. L., Singh, S., Smith, M. & Bartek, B. (March 2011). *Predicting Task Performance from Individual Variation in Eye-Movement Control Strategies*. In *Proceedings of the CUNY Sentence Processing Conference*. Stanford, CA.
- 2010 Lewis, R. L. and Badecker, W. (March 2010). *Short-term memory in Sentence Production and its Adaptive Control*. In *Proceedings of the CUNY Sentence Processing Conference*. New York, NY.
- Bartek, B., Lewis, R. L. and Vasishth, S. (March 2010). *Distinguishing Effects of Expectation and Integration in Non-local Dependencies*. In *Proceedings of the CUNY Sentence Processing Conference*. New York, NY.
- Strohmingner, N., Lewis, R.L. and Meyer D.E. (January 2010). *The Politics of Purity*. Society for Personality and Social Psychology, Las Vegas, NV.
- 2009 Strohmingner, N., Lewis, R. L., and Meyer D.E. (February 2009). *What Would Seinfeld Do? Divergent effects of different positive emotions on moral judgment*. Society for Personality and Social Psychology, Tampa, FL.
- 2008 Strohmingner, N., Lewis, R.L., and Meyer D.E. (June 2008). *The Differential Effect of Positive Social Emotions on Moral Decisions: An eyetracking study*. Social and Affective Neuroscience Society Annual Meeting, Boston, MA.
- Strohmingner, N., Lewis, R.L., and Meyer D.E. (July 2008). *Positive Emotions and Moral Decisions*. Cognitive Science Institute: Minds and Societies, Montreal, Canada.
- 2007 Bartek, B., Lewis, R. L., Vasishth, S., and Smith, M. (2007). *Linking Working Memory with SPR and Eyetracking Measures*. In *Proceedings of the CUNY Sentence Processing Conference*. San Diego, CA.
- Fernandez-Salgueiro, G., Chen, L. Lewis, R. L., and Epstein, S. (2007). *The When and How of Positing Null Subjects (pro): The Timing and Surprising Interaction of Syntactic and Semantic Constraints*. In *Proceedings of the CUNY Sentence Processing Conference*. San Diego, CA.
- Badecker, W. and Lewis, R. L. (2007) *A New Theory and Computational Model of Working Memory in Sentence Production: Agreement Errors as Failures of Cue-based Retrieval*. In *Proceedings of the CUNY Sentence Processing Conference*. San Diego, CA.
- Patil, Umesh, Bartek, B. and Lewis, R. L. (2007). *The Interplay of Locality and Surprisal*. In *Proceedings of the CUNY Sentence Processing Conference*. San Diego, CA.
- 2006 Lewis, R. L. (2006). *The surprising nature of working memory in sentence comprehension: Insights from cognitive architectures and psycholinguistics*. *Proceedings of the International Conference on Cognitive Modeling*, April, 2006, Trieste, Italy.
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- 2000 Van Dyke, J. and Lewis, R. L. (2000). *Distinguishing effects of decay and interference on attachment and reanalysis in temporarily ambiguous sentences. Thirteenth Annual CUNY Sentence Processing Conference, University of San Diego, California.*
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Research funding

- 2023–2027 NSF-SSRC: Reducing Vaccine Hesitancy Through Interactive Decision Aids, National Science Foundation, \$499K, 2023–2027 (with John Jonides and Priti Shah).
- 2020–23 The Cognitive Foundations of Social Minds, Templeton World Charity Foundation, \$1M, 2020–23 (with Francine Dolins (UM Dearborn), Josep Call (St. Andrews) and Josh Tenenbaum (MIT)).
- RAPID: Predicting the Spread of the COVID-19 Virus, National Science Foundation, \$200K, 2020–2021 (with John Jonides and Priti Shah).
- 2017–2019 Adapting Rational Choice to Cognitive Bounds: Improving Decisions Involving Tradeoffs. The Templeton World Charity Foundation, \$200K, 2017–2019 (with Andrew Howes).
- 2015–2018 Combining Reinforcement Learning and Deep Learning Methods to Address High-dimensional Perception, Partial Observability and Delayed Reward, National Science Foundation, \$500K, 2015–2018 (with Honglak Lee and Satinder Singh).
- 2012–2016 Language Processing as Bounded Optimal Control of Memory, Perception and Action, National Science Foundation, \$406K, 2012–2016 (with Satinder Singh).
- Towards Understanding Robust Individual & Collaborative Monitoring, Air Force Research Labs (Wright-Patterson), \$109K, 2012–2015.
- 2011–2013 EAGER: On the Optimal Rewards Problem, National Science Foundation (with Satinder Singh), \$200K, 2011–2013.
- 2012–2013 Human-Automation Interaction for New Flight Deck Technologies: The Development and Application of Bounded Optimal Control Approaches to Human Performance Modeling for Aviation, \$146K, NASA/FAA, 2012–2013.
- 2009– Building Flexible, Robust, and Autonomous Agents, National Science Foundation, \$1.3M, July 2009–June 2013. Co-PI with Satinder Singh, John Laird, and Thad Polk.

- 2010–2011 Human-automation Interaction Methods for Evaluation of New Technologies, \$86K, FAA, 2010–2011.
- 2009– Toward Adaptive Cognitive Models of Attention and Situation Awareness, \$130K, NASA, August 2009–July 2010.
- 2005– Affordable Cognitive Modeling for Interface Design, Workload Design, and Procedure Development: Automating the Application of Psychological Theory, \$806K, Office of Naval Research, October 2005–April 2009.
- Extending the Soar Cognitive Architecture, \$1M, DARPA, Fall 2005–Fall 2006. Co-PI with John Laird (EECS, Michigan).
- Development and Application of a Compositional Parametric Approach to Human Performance Prediction, \$371K, NASA, January 2005–December 2006.
- 2004– Toward Parametric Compositional Modeling of Heterogeneous Interactive tasks, \$167K, NASA, June 2004–June 2007.
- Toward an Applied Psychological Theory of Behavior Composition: Language Processing in Multitasking Contexts, \$297K, NASA, May 2004–July 2007.
- 2002– Scalable Cognitive Modeling Through Compositional Reuse, Office of Naval Research, \$675K total, awarded to University of Michigan (\$236K), Carnegie Mellon, and NASA Ames. November 2002–October 2005. With Bonnie John (CMU), Alonso Vera, Mike Matessa, and Roger Remington (NASA Ames).
- 1998– Computational Models and Coordinated Neuroimaging of Learning and Cognitive Function, \$1.2M, September 1998–August 2003, National Science Foundation. (with Walter Schneider, PI, University of Pittsburgh).
- 1999– Establishing Ohio State as a Major Center for Language Processing Research, Ohio State Center for Cognitive Science, Department of Linguistics, and Department of Computer and Information Science, \$100K, December 1999–December 2001. With Shari Speer, Department of Linguistics.
- Computational and Psycholinguistic Explorations of Working Memory in Japanese Sentence Comprehension, Ohio State Interdisciplinary Seed Grant, \$57K, July 1999–June 2001. With JJ Nakayama, Department of East Asian Languages and Literature, Ohio State University.
- 1996– Computational and Psycholinguistic Explorations of Ambiguity Resolution in Natural Language Processing, Ohio State Office of Research, \$18K, January 1996–July 1997.

Professional affiliations

AAAI (American Association for Artificial Intelligence)
 APS (American Psychological Society)
 ACL (Association for Computational Linguistics)
 ACM (Association for Computing Machinery)
 Cognitive Science Society