

Vita

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DEGREES

Ph.D. in mathematical physics, Indiana University, 1981.
M.S. in physics, Indiana University, 1977.
A.B. *summa cum laude* in physics, Harvard University, 1976.

PROFESSIONAL POSITIONS

Krieger-Eisenhower Professor of Cognitive Science, Johns Hopkins University, 2006–present.
Full Professor, Department of Cognitive Science, Johns Hopkins University, 1994–present.
Chair, Department of Cognitive Science, Johns Hopkins University, Jan. 1997–June 1998 (Acting), July 1998–June 2000
Adjunct Professor, Department of Linguistics, University of Maryland at College Park, 1994–present.
Faculty, Center for the History and Philosophy of Science, Johns Hopkins University, 1995–present.
Assistant Director, Center for Language and Speech Processing, Johns Hopkins University, 1995–present.
Director, NSF IGERT Training Program, Unifying the Science of Language, 2006–2011
Director, NSF IGERT Training Program in the Cognitive Science of Language, 1999–2006

Professor, Department of Computer Science, University of Colorado at Boulder,
Full Professor, 1994–95 (on leave, 1994–95).
Associate Professor, 1990–94.
Assistant Professor, 1985–90.

Assistant Research Cognitive Scientist (Assistant Professor – Research), Institute for Cognitive Science,
University of California at San Diego, 1982–85.
Visiting Scholar, Program in Cognitive Science, University of California at San Diego, 1981–82.

Faculty, 15th Summer School in Cognitive Science, New Bulgarian University, Sofia, 2008.
Faculty, LSA Summer Linguistic Institute, MIT, 2005.
Visiting faculty, Department of Cognitive Studies, Ecole Normale Supérieure, Paris, 2005.
Visiting lecturer, Linguistics Department, Tromsø University, Norway, 2004.
Faculty, First International Summer Institute in Cognitive Science, SUNY Buffalo, 1994.
Faculty, Linguistic Institute, University of California at Santa Cruz, 1991.
Faculty, Connectionist Models Summer School; Carnegie-Mellon University, 1986, 1988; University of California, San Diego, 1990; University of Colorado, Boulder, 1993.

Faculty, Advanced Course in Artificial Intelligence, Neuchâtel, Switzerland, 1989.
Consultant, Xerox Palo Alto Research Center, Intelligent Systems Laboratory, 1987.
Visiting Scholar, Linguistic Institute, Stanford University, 1987.

National Science Foundation, John H. Edwards, and Indiana University Graduate Fellow, 1976–81.
Associate Instructor, Department of Physics, Indiana University, 1976–81.
Project Specialist, Institute for Research on Poverty, University of Wisconsin, 1978.
Consultant, California Planning and Conservation Foundation, 1975.
Undergraduate Teaching Assistant, Committee on Natural Sciences, Harvard University, 1974–75.

PROFESSIONAL AWARDS

Chaire Internationale de Recherche Blaise Pascal, l'Etat et la Région d'Ile-de-France, 2008–2009
David E. Rumelhart Prize for Contributions to the Theoretical Foundations of Human Cognition, 2005.
Fellow, Cognitive Science Society, elected 2005.
Scheduled Fellow, Center for Advanced Study in the Behavioral Sciences, Stanford, 2003.
Guggenheim Foundation Fellowship, 1995–96.
Faculty Fellowship, University of Colorado, 1991–92.
Visiting Scholarship, Program in Cognitive Science, University of California at San Diego, 1981–82.

John H. Edwards Fellowship ("the most highly prized graduate fellowship awarded directly by Indiana University"), 1980–81.
Lieber Associate Instructor Award (6 awarded annually system-wide), Indiana University, 1979.
Associate Instructor Teaching Award, Physics Department, Indiana University, 1978.
National Science Foundation Graduate Fellowship in Mathematical Physics, 1977–80.
Indiana University Department of Physics Graduate Fellowship, 1976–80.

A.B. with honors in physics, Harvard University; among top five graduates of 1976.
Master's Award, Dudley House, Harvard University, 1976.
Detur Prize, Harvard University, 1975.
Phi Beta Kappa membership, Harvard College chapter, 1975.
John Harvard Scholarship, Harvard University, 1973–74, 1974–75.
Edwards Whitaker Scholarship, Harvard University, 1974.

PROFESSIONAL SERVICE

Selection Committee, David E. Rumelhart Prize for Contributions to the Theoretical Foundations of Human Cognition, 2007 – present.
President, Society for Philosophy and Psychology. 2000 – 01.
President, Cognitive Science Society. 1995 – 96, 1996 – 97.
Annual Conference Oversight Committee, Cognitive Science Society. 1995 – 98.
Governing Board, Cognitive Science Society. 1992 – 98.
Executive Board, Society for Philosophy and Psychology. 1988 – 91, 1994 – 97.
International Advisory Board, Cognitive Science Department, New Bulgarian University. 1993 – present.
Editorial Board, *Minds and Machines: Journal for Artificial Intelligence, Philosophy, and Cognitive Science*. 1990 – present.
Editorial Board, *Cognitive Science*. 1988 – present.
Editorial Board, *Connection Science: A Journal of Neural Computing, Artificial Intelligence, and Cognitive Research*. 1988 – present.

Advisory Board, Neural Network Series, MIT Press. 1990 – present.

Advisory Editorial Board, *Network: Computation in Neural Systems*. 1989 – 91.

Co-organizer, Second IGERT Workshop: The Cognitive Science of Language. Baltimore, January 2004.

Program Committee, Cognitive Science Society Conference, Boston, August 2003.

Co-organizer, First IGERT Workshop: The Cognitive Science of Language. Baltimore, January 2003.

Organizer, Symposium on the Mathematics of Optimality Theory, Annual Meeting of the American Association for the Advancement of Science, San Francisco, CA, February 2001.

Program Committee, Cognitive Science Society Conference, University of Pennsylvania, August 2000.

Organizing Committee, Cognitive Science Society Conference, Stanford, CA, July 1997.

Organizer, Symposium on Connectionism and Language, Annual Meeting of the American Association for the Advancement of Science, Baltimore, MD, February 1996.

Program Committee, Association for Computational Linguistics Conference, Cambridge, MA, June 1995.

Organizer, Symposium on Connectionism and Cognitive Science, First International Summer Institute in Cognitive Science, Buffalo, NY, July 1994.

Organizing Committee, Cognitive Science Society Conference, Boulder, CO, June 1993.

Organizing Committee, Connectionist Models Summer School, Boulder, CO, June 1993.

Honorary Organizing Committee, Neural Networks Symposium, International Symposia on Information Sciences, Iizuka, Kyushu, Japan, July, 1992.

BOOKS

- [1] Smolensky, P., & Legendre, G. 2006. *The Harmonic Mind: From Neural Computation to Optimality-Theoretic Grammar*. Vol. 1: *Cognitive Architecture*; vol. 2: *Linguistic and Philosophical Implications*. Cambridge, MA: MIT Press.
- [2] Prince, A. & Smolensky, P. 2004 *Optimality Theory: Constraint Interaction in Generative Grammar*. Malden, MA: Blackwell. Excerpted in McCarthy, John J. ed. 2003. *Optimality Theory in Phonology: A Reader*, 3-71. Malden, MA: Blackwell. Chapter 6 reprinted in [1], Chapter 13. Vol. 2, 3-25.
- [3] Tesar, B. & Smolensky, P. 2000. *Learnability in Optimality Theory*. MIT Press.
- [4] Smolensky, P., Mozer, M. C., & Rumelhart, D. E. (Eds.). 1996. *Mathematical Perspectives on Neural Networks*. Mahwah, NJ: Lawrence Erlbaum Publishers [Contributed 4 of 20 chapters; 109 of 841 pages].
- [5] Macdonald, C. & Macdonald, G. (Eds.). 1995. *Connectionism: Debates on Psychological Explanation, Volume Two*. Oxford: Basil Blackwell. [Contributed 4 of 11 chapters, 183 of 412 pp.]
- [6] Mozer, M.C., Smolensky, P., Touretzky, D., Elman, J., & Weigend, A. (Eds.). 1993. *Proceedings of the Connectionist Models Summer School 1993*. Hillsdale, NJ: Lawrence Erlbaum Publishers.
- [7] Smolensky, P. 1992. *Il Connessionismo: tra simboli e neuroni*. Translation of the entire treatment, including peer commentary: On the proper treatment of connectionism, *The Behavioral and Brain Sciences*, **11**, 1-74; with introduction by Marcello Frixione. Genova: Marietti/Cambridge University Press.

PAPERS (by general topic area)

Grammar (ROA = <http://rucss.rutgers.edu/roa.html>, the Rutgers Optimality Archive)

- [8] Berent, Iris, Tracy Lennertz, and Paul Smolensky. In press (2010). Markedness and misperception: It's a two-way street. In C. Cairns & E. Raimy (Eds). *Perspectives on the syllable*. Brill Publishers..
- [9] Legendre, Géraldine and Paul Smolensky. In press (2010). Optimality Theory. In Patrick Colm Hogan (ed.), *The Cambridge Encyclopedia of the Language Sciences*. Cambridge University Press.

- [10] Smolensky, Paul and Emmanuel Dupoux. (2009). Universals in cognitive theories of language. *Behavioral and Brain Sciences*, 32, 468-469.
- [11] Berent, Iris, Tracy Lennertz, Paul Smolensky and Vered Vaknin. (2009). Speakers' knowledge of phonological universals: Evidence from nasal clusters. *Phonology* 26, 75-108.
- [12] Legendre, Géraldine and Paul Smolensky. French inchoatives and the Unaccusativity Hypothesis. (2009). In Donna B. Gerdts, John C. Moore, and Maria Polinsky (eds.) *Hypothesis A/Hypothesis B: Linguistic Explorations in Honor of David M. Perlmutter*. Current Studies in Linguistics 49. Cambridge, Mass.: MIT Press. 229-246.
- [13] Berent, Iris, Tracy Lennertz, Jongho Jun, Miguel A. Moreno, and Paul Smolensky. 2008. Language universals in human brains. *Proceedings of the National Academy of Sciences USA* 105 (14), 5321-5.
- [14] Smolensky, Paul. 2008. Introduction to the 2006 Rumelhart Prize Special Issue Honoring Roger Shepard. *Cognitive Science* 32 (1), 1-2.
- [15] Smolensky, Paul. 2006. On theoretical facts and empirical abstractions. In E. Bakovic, J. Ito, and J. McCarthy (eds.), *Wondering at the Natural Fecundity of Things: Essays in Honor of Alan Prince*. Santa Cruz, CA: Linguistics Research Center [<http://repositories.cdlib.org/lrc/prince/13>].
- [16] Hale, John & Smolensky, Paul. 2006. Harmonic Grammars and harmonic parsers for formal languages. In [1]. Chapter 10. Vol. 1, 393-415.
- [17] Legendre, Géraldine, Smolensky, Paul, & Miyata, Yoshiro. 2006. Harmonic Grammar and its subsymbolic foundations. In [1]. Chapter 11. Vol. 1, 417-452.
- [18] Smolensky, Paul, Legendre, Géraldine, & Tesar, Bruce. 2006. Principles of Optimality Theory. In [1]. Chapter 12. Vol. 1, 453-544.
- [19] Smolensky, Paul. 2006. Optimality in phonology II: Markedness, feature domains, and Local Constraint Conjunction. In [1]. Chapter 14. Vol. 2, 27-160.
- [20] Stevenson, Suzanne & Smolensky, Paul. 2006. Optimality in sentence processing. In [1]. Chapter 19. Vol. 2, 307-338.
- [21] Legendre, Géraldine, Sorace, Antonella & Smolensky, Paul. 2006. The Optimality Theory – Harmonic Grammar connection. In [1]. Chapter 20. Vol. 2, 339-402.
- [22] Davidson, Lisa, Smolensky, Paul, and Jusczyk, Peter W. 2004. The initial and final states: Theoretical implications and experimental explorations of richness of the base. In René Kager, Joe Pater and Wim Zonneveld, eds. *Fixing Priorities: Constraints in Phonological Acquisition*, 321-368. Cambridge, England: Cambridge University Press. Reprinted in [1], Chapter 17. Vol. 2, 231-278. Rutgers Optimality Archive 428.
- [23] Hagstrom P., J. Chen-Main, G. Legendre, L. Tao, and P. Smolensky, 2004. Deriving output probabilities in Child Mandarin from a Dual-Optimization grammar. *Lingua*. 114 (9-10): 1147-1185.
- [24] Smolensky, Paul. 2003. Markedness, Harmony, and phonological invisibility. *Journal of Cognitive Science*. 4:1-41.
- [25] Prince, Alan, and Smolensky, Paul. 2003. Optimality Theory in phonology. In *International Encyclopedia of Linguistics*, ed. William John Frawley. Oxford, England: Oxford University Press.
- [26] Buchwald, Adam, Schwartz, Oren, Seidl, Amanda, & Smolensky, Paul. 2002. Recoverability Optimality Theory: Discourse Anaphora in a Bi-directional framework. *Proceedings of the EDILOG Conference*, Edinburgh. 8 pages.
- [27] Moreton, Elliott, and Smolensky, Paul. 2002. Typological Consequences of Local Constraint Conjunction. *Proceedings of the 21st West Coast Conference on Formal Linguistics*.
- [28] Jusczyk, Peter W., Smolensky, Paul, and Allocco, Theresa. 2002. How English-learning infants respond to markedness and faithfulness constraints. *Language Acquisition* 10:31-73.
- [29] Smolensky, Paul. 2002. Optimality Theory: Frequently Asked 'Questions'. *Phonological Studies* 5, 91-98.
- [30] Smolensky, Paul. 2002. Why OT now? *Phonological Studies* 5, 127-134.

- [31] Smolensky, Paul. 2001. Optimality Theory. In *MIT Encyclopedia of the Cognitive Sciences*, eds. Robert A. Wilson and Frank C. Keil. Cambridge, MA: MIT Press/Bradford Books.
- [32] Smolensky, Paul. 2001. Optimality Theory: Frequently Asked 'Questions'. In Japanese translation: *Gengo*, September, Tokyo: Taishukan; Haruka Fukazawa and Mafuyu Kitahara, translators.
- [33] Smolensky, Paul. 2001. Why OT now? In Japanese translation: *Gengo*, September, Tokyo: Taishukan; Haruka Fukazawa and Mafuyu Kitahara, translators.
- [34] Soderstrom, Melanie, Mathis, Donald W., and Smolensky, Paul. 2001. Toward computational empirical testing of linguistic innateness: Abstract genomic encoding of an Optimality-Theoretic grammar. *Proceedings of the Third International Conference on Cognitive Science*, Beijing, China, 14-25. University of Science and Technology of China Press.
- [35] Hale, John and Smolensky, Paul. 2001. A parser for harmonic context-free grammars. *Proceedings of the 23rd Annual Conference of the Cognitive Science Society*. Johanna D. Moore and Keith Stenning, editors. pages 427-432.
- [36] Smolensky, P. 1999. Grammar-based connectionist approaches to language. *Cognitive Science*. 23, 589–613. Reprinted in M. Christiansen and N. Chater. 2001. *Connectionist Psycholinguistics*. Ablex. Reprinted in [1], Chapter 22. Vol. 2, 475–502.
- [37] Tesar, B. & Smolensky, P. 1998. Learning Optimality-Theoretic grammars. *Lingua*, 106: 161–196. Reprinted in Sorace, A., Heycock, C. and Shillcock, R. (eds.) *Language Acquisition: Knowledge Representation and Processing*. Amsterdam: Elsevier.
- [38] Legendre, G., Smolensky, P., & Wilson, C. 1998. When is less more? Faithfulness and minimal links in *wh*-chains. In Pilar Barbosa, Danny Fox, Paul Hagstrom, Martha McGinnis, and David Pesetsky, eds., *Is the Best Good Enough? Optimality and Competition in Syntax*. MIT Press. 249–289. Excerpted in [1], Chapter 16. Vol. 2, 183–230.
- [39] Tesar, B. & Smolensky, P. 1998. Learnability in Optimality Theory. *Linguistic Inquiry*, 29: 229–268
- [40] Prince, A. & Smolensky, P. 1997. Optimality: From neural networks to universal grammar. *Science* 275: 1604–1610.
- [41] Smolensky, P. 1996. On the comprehension/production dilemma in child language. *Linguistic Inquiry* 27: 720–731. ROA-118.
- [42] Legendre, G., Smolensky, P., & Wilson, C. 1996. When is less more? Faithfulness and minimal links in *wh*-chains. Technical Report JHU-CogSci-96-7, Cognitive Science Department, Johns Hopkins University. ROA-117. Published as [38].
- [43] Smolensky, P. 1996. The initial state and 'richness of the base' in Optimality Theory. Technical Report JHU-CogSci-96-4, Cognitive Science Department, Johns Hopkins University. ROA-154. Accepted for publication in 1997 by *Linguistic Inquiry*.
- [44] Tesar, B. & Smolensky, P. 1996. Learnability in Optimality Theory (long version). Technical Report JHU-CogSci-96-3, Cognitive Science Department, Johns Hopkins University, Baltimore, Md. ROA-156. Excerpts, revised, published as [37].
- [45] Tesar, B. & Smolensky, P. 1996. Learnability in Optimality Theory (short version). Technical Report JHU-CogSci-96-2, Cognitive Science Department, Johns Hopkins University, Baltimore, Md. ROA-155. Revision published as [39].
- [46] Legendre, G., Wilson, C., Smolensky, P., Homer, K., & Raymond, W. 1995. Optimality in *wh*-chains. *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, J. Beckman, S. Urbanczyk, & L. Walsh, eds. Amherst, MA: GLSA, University of Massachusetts. 607–636. ROA-85.
- [47] Smolensky, P. 1995. On the structure of *Con*, the constraint component of UG. Handout of talk at UCLA, April 7. ROA-86
- [48] Tesar, B. & Smolensky, P. 1994. The learnability of Optimality Theory. *Proceedings of the West Coast Conference on Formal Linguistics XIII*. 122–137.

- [49] Tesar, B. & Smolensky, P. 1993. The learnability of Optimality Theory: An algorithm and some basic complexity results. Technical Report CU-CS-678-93, Department of Computer Science, University of Colorado at Boulder. October. ROA-2. Expanded to [44].
- [50] Prince, A. & Smolensky, P. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. Technical Report CU-CS-696-93, Department of Computer Science, University of Colorado at Boulder, and Technical Report TR-2, Rutgers Center for Cognitive Science, Rutgers University, New Brunswick, NJ. April. (234 pages).
- [51] Smolensky, P. 1993. Harmony, markedness, and phonological activity. Handout of keynote address, Rutgers Optimality Workshop – 1, October 23. ROA-87.
- [52] Legendre, G., Raymond, W., & Smolensky, P. 1993. An Optimality-Theoretic typology of case and grammatical voice systems. *Proceedings of the Nineteenth Annual Meeting of the Berkeley Linguistics Society*. Berkeley, CA. February. 464–478. ROA-3. Reprinted in [1], Chapter 15. Vol. 2, 161–181.
- [53] Legendre, G., Miyata, Y., & Smolensky, P. 1991. Unifying syntactic and semantic approaches to unaccusativity: A connectionist approach. In L. Sutton & C. Johnson (with Ruth Shields) (Eds.), *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistics Society*. Berkeley, CA. February. 156–167.
- [54] Prince, A. & Smolensky, P. 1991. Notes on Connectionism and Harmony Theory in Linguistics. Technical Report CU-CS-533-91, Department of Computer Science, University of Colorado at Boulder. July. [Notes from the course, ‘Connectionism and Harmony Theory in Linguistics,’ LSA Linguistic Institute, University of California, Santa Cruz; July, 1991.] Optimality Theory part expanded to [50].
- [55] Legendre, G., Miyata, Y., & Smolensky, P. 1990. Can connectionism contribute to syntax? Harmonic Grammar, with an application. *Proceedings of the 26th Meeting of the Chicago Linguistic Society*. Chicago, IL. April.
- [56] Legendre, G., Miyata, Y., & Smolensky, P. 1990. Harmonic Grammar – A formal multi-level connectionist theory of linguistic well-formedness: An application. *Proceedings of the Twelfth Annual Conference of the Cognitive Science Society*, Cambridge, MA. July. 884–891.
- [57] Legendre, G., Miyata, Y., & Smolensky, P. 1990. Harmonic Grammar – A formal multi-level connectionist theory of linguistic well-formedness: Theoretical foundations. *Proceedings of the Twelfth Annual Conference of the Cognitive Science Society*, Cambridge, MA. July. 388–395.

Computation

- [58] Smolensky, Paul & Tesar, Bruce. 2006. Symbolic computation with activation patterns. In [1]. Chapter 7. Vol. 1, 235–270.
- [59] Smolensky, Paul. 2006. Tensor product representations: Formal foundations. In [1]. Chapter 8. Vol. 1, 271–344.
- [60] Smolensky, Paul. 2006. Constraints and optimization: Harmony maximization. In [1]. Chapter 9. Vol. 1, 345–392.
- [61] Smolensky, P. 2003. Connectionism. In *International Encyclopedia of Linguistics*, ed. William John Frawley. Oxford, England: Oxford University Press.
- [62] Smolensky, Paul. 2001. Connectionist approaches to language. In *MIT Encyclopedia of the Cognitive Sciences*, eds. Robert A. Wilson and Frank C. Keil. Cambridge, MA: MIT Press/Bradford Books.
- [63] Smolensky, P. 1996. Computational, dynamical, and statistical perspectives on the processing and learning problems in neural network theory. In [4]. 1–15.
- [64] Smolensky, P. 1996. Computational perspectives on neural networks. In [4]. 17–40.
- [65] Smolensky, P. 1996. Dynamical perspectives on neural networks. In [4]. 245–270.
- [66] Smolensky, P. 1996. Statistical perspectives on neural networks. In [4]. 453–496.

- [67] Tesar, B. & Smolensky, P. 1994. Synchronous-firing variable binding is spatio-temporal tensor product representation. *Proceedings of the 16th Annual Conference of the Cognitive Science Society*. 870–875. Atlanta, GA. August.
- [68] Smolensky, P. 1993. Harmonic Grammars for formal languages. In S. Hanson, J. D. Cowan, & C. L. Giles, (Eds.), *Advances in Neural Information Processing Systems 5*, San Mateo, CA: Morgan Kaufmann. [Collected papers of the IEEE Conference on Neural Information Processing Systems – Natural and Synthetic, Denver, Nov. 1992.] 847–854.
- [69] Miyata, Y, Smolensky, P., & Legendre, G. 1993. Distributed representation and parallel processing of recursive structures. *Proceedings of the 15th Annual Conference of the Cognitive Science Society*, Boulder, CO. June. 759–764.
- [70] Wagner, K., Mozer, M., Smolensky, P., Miyata, Y., Fellows, M. 1993. Optical neural networks using a new radial nonlinear neural layer. *Proceedings of the SPIE (Society of Photo-Optical Instrumentation Engineers)*, 1773A–10.
- [71] McMillan, C., Mozer, M., & Smolensky, P. 1993. Dynamic conflict resolution in a connectionist rule-based system. *Proceedings of the 13th International Joint Conference on Artificial Intelligence*, 1366–1371. San Mateo, CA: Morgan Kauffmann.
- [72] McMillan, C., Mozer, M., & Smolensky, P. 1992. Rule induction through integrated symbolic and subsymbolic processing. In J. Moody, S. Hanson, & R. Lippman, (Eds.), *Advances in Neural Information Processing Systems 4*. San Mateo, CA: Morgan Kaufmann. [Collected papers of the IEEE Conference on Neural Information Processing Systems – Natural and Synthetic, Denver, Nov. 1991.] 969–976.
- [73] Smolensky, P. 1992. Integrated connectionist/symbolic computation and formal languages. *Proceedings of the International Symposia on Information Sciences*. Iizuka, Kyushu, Japan. July. 42–49.
- [74] Smolensky, P. 1991. Connectionism. In W. Bright (Ed.) *The International Encyclopedia of Linguistics*. Oxford University Press. 294–297.
- [75] Legendre, G., Miyata, Y., & Smolensky, P. 1991. Distributed recursive structure processing. In Touretzky, D. S., Lippman, R. (Eds.), *Advances in Neural Information Processing Systems 3*. San Mateo, CA: Morgan Kaufmann. [Collected papers of the IEEE Conference on Neural Information Processing Systems – Natural and Synthetic, Denver, Nov. 1990.] 591–597. Slightly expanded version in Mayoh, B. (Ed.), *Scandinavian Conference on Artificial Intelligence–91*, 47–53. Amsterdam: IOS Press.
- [76] McMillan, C., Mozer, M. C., & Smolensky, P. 1991. The connectionist scientist game: Rule extraction and refinement in a neural network. *Proceedings of the Thirteenth Annual Conference of the Cognitive Science Society*, Chicago, IL. July.
- [77] McMillan, C., Mozer, M., & Smolensky, P. 1991. Learning explicit rules in a neural network. *Proceedings of the International Joint Conference on Neural Networks*. Seattle, WA. July.
- [78] Smolensky, P. 1990. Tensor product variable binding and the representation of symbolic structures in connectionist networks. *Artificial Intelligence*, 46, 159–216. [Reprinted in G. Hinton, (Ed.), 1990, *Connectionist symbol processing*, Elsevier/MIT Press.]
- [79] Brousse, O. & Smolensky, P. 1990. Connectionist generalization and incremental learning in combinatorial domains. In H. Haken (Ed.), *Synergetics of Cognition*. Springer-Verlag. 70–80.
- [80] Smolensky, P. 1990. Representation in connectionist networks. *Intellectica: The Journal of the French Association for Cognitive Research*, 9–10, 127–165.
- [81] Brousse, O. & Smolensky, P. 1990. Interference and generalization in connectionist networks: Within-domain structure or between-domain correlation? – A response, *Neural Network Review*, 4, 29.
- [82] Mozer, M. C., & Smolensky, P. 1989. Using relevance to reduce network size automatically. *Connection Science*, 1, 3–16.

- [83] Dolan, C. & Smolensky, P. 1989. Tensor Product Production System: A modular architecture and representation. *Connection Science*, **1**, 53–68.
- [84] Mozer, M. C., & Smolensky, P. 1989. Skeletonization: Trimming the fat from a network via relevance assessment. In D. S. Touretzky (Ed.), *Advances in Neural Information Processing Systems 1*. San Mateo, CA: Morgan Kaufmann. [Collected papers of the IEEE Conference on Neural Information Processing Systems—Natural and Synthetic, Denver, Nov. 1988.] 107–115.
- [85] Brousse, O. & Smolensky, P. 1989. Virtual memories and massive generalization in connectionist combinatorial learning. *Proceedings of the Eleventh Annual Meeting of the Cognitive Science Society*. Ann Arbor, MI. August. 380–387.
- [86] Smolensky, P. 1988. Analysis of distributed representation of constituent structure in connectionist systems. *Proceedings of Neural Information Processing Systems–87*. Denver, CO. November. 730–739.
- [87] Bein, J. & Smolensky, P. 1988. Application of the interactive activation model to document retrieval. *Proceedings of Neuro-Nîmes 1988: Neural networks and their applications*. Nîmes, France. November. 295–308.
- [88] McMillan, C. & Smolensky, P. 1988. Analyzing a connectionist model as a system of soft rules. *Proceedings of the Tenth Annual Meeting of the Cognitive Science Society*. Montreal, Canada. August. 62–68.
- [89] Dolan, C. & Smolensky, P. 1988. Implementing a connectionist production system using tensor products. In D. Touretzky, G. E. Hinton, & T. J. Sejnowski (Eds.), *Proceedings of the Connectionist Models Summer School, 1988*. Morgan Kaufmann. 265–272.
- [90] Smolensky, P. 1987. On variable binding and the representation of symbolic structures in connectionist systems. Technical Report CU-CS-355-87, Department of Computer Science, University of Colorado at Boulder. February.
- [91] Smolensky, P. 1986. Formal modeling of subsymbolic processes: An introduction to harmony theory. In N. E. Sharkey (Ed.), *Directions in the Science of Cognition*. London: Horwoods. 204–235.
- [92] Smolensky, P. 1986. Information processing in dynamical systems: Foundations of harmony theory. In D. E. Rumelhart, J. L. McClelland, & the PDP Research Group, *Parallel Distributed Processing: Explorations in the Microstructure of Cognition. Volume 1: Foundations*. Cambridge, MA: MIT Press/Bradford Books. 194–281.
- [93] Smolensky, P. 1986. Neural and conceptual interpretations of parallel distributed processing models. In J. L. McClelland, D. E. Rumelhart, & the PDP Research Group, *Parallel Distributed Processing: Explorations in the Microstructure of Cognition. Volume 2: Psychological and Biological Models*. Cambridge, MA: MIT Press/Bradford Books. 390–431.
- [94] Rumelhart, D. E., Smolensky, P., McClelland, J. L., & Hinton, G. E. 1986. Schemata and sequential thought processes in parallel distributed processing. J. L. McClelland, D. E. Rumelhart, & the PDP Research Group, *Parallel Distributed Processing: Explorations in the Microstructure of Cognition. Volume 2: Psychological and Biological Models*. Cambridge, MA: MIT Press/Bradford Books. 7–57. [Reprinted in A. Collins & E. Smith (Eds), 1988, *Readings in Cognitive Science*, San Mateo, CA: Morgan Kaufmann.]
- [95] Smolensky, P. 1984. The mathematical role of self-consistency in parallel computation. *Proceedings of the Sixth Annual Conference of the Cognitive Science Society*. Boulder, CO. June. 319–325.
- [96] Riley, M. S. & Smolensky, P. 1984. A parallel model of (sequential) problem solving. *Proceedings of the Sixth Annual Conference of the Cognitive Science Society*. Boulder, CO. June. 286–292.
- [97] Smolensky, P. 1984. Harmony theory: thermal parallel models in a computational context. In P. Smolensky & M. S. Riley, *Harmony theory: Problem solving, parallel cognitive models, and thermal physics*, Technical Report 8404. Institute for Cognitive Science, University of California at San Diego. April.
- [98] Hinton, G. E. & Smolensky, P. 1984. Parallel computation and the mass-spring model of motor control. Report 123. Center for Human Information Processing, University of California at San Diego. June.

- [99] Smolensky, P. 1983. Schema selection and stochastic inference in modular environments. *Proceedings of the National Conference on Artificial Intelligence*. Washington, DC. August. 378–382.

Foundations

- [100] Smolensky, Paul & Legendre, Géraldine. 2006. The unity of cognitive science: Methodological considerations. In [1]. Chapter 3. Vol. 1, 99–121.
- [101] Smolensky, Paul. 2006. Computational levels and integrated connectionist/symbolic explanation. In [1]. Chapter 23. Vol. 2, 503–592.
- [102] Smolensky, P. 1995. Constituent structure and explanation in an integrated connectionist/symbolic cognitive architecture. In C. Macdonald & G. Macdonald (Eds.). *Connectionism: Debates on Psychological Explanation, Volume Two*. 221–290. Oxford: Basil Blackwell.
- [103] Smolensky, P. 1995. On the projectable predicates of connectionist psychology: A case for belief. In C. Macdonald & G. Macdonald (Eds.). *Connectionism: Debates on Psychological Explanation, Volume Two*. 357–394. Oxford: Basil Blackwell.
- [104] Smolensky, P. 1994. Computational theories of mind. In S. Guttenplan (Ed.), *A Companion to the Philosophy of Mind*. Blackwell Publishers. 176–185.
- [105] Smolensky, P. 1991. Connectionism, constituency, and the language of thought. In B. Loewer & G. Rey (Eds.), *Meaning in Mind: Fodor and his Critics*. Oxford: Basil Blackwell. 201–227. [Reprinted in C. Macdonald & G. Macdonald (Eds.), 1995, *Connectionism: Debates on Psychological Explanation, Volume Two*, Oxford: Basil Blackwell. French translation: Connexionnisme, constituance et le langage de la pensée. *Bulletin de Psychologie* 55(1): 51–69.]
- [106] Smolensky, P. 1990. Connectionism and the foundations of AI. In D. Partridge & Y. Wilks (Eds.), *The Foundations of Artificial Intelligence: A Sourcebook*. Cambridge: Cambridge University Press. 306–326.
- [107] Smolensky, P. 1989. Connectionism and constituent structure. In R. Pfeifer, Z. Schreter, F. Fogelman, & L. Steels (Eds.), *Connectionism in Perspective*. Amsterdam: Elsevier. 3–24.
- [108] Smolensky, P. 1989. Connectionist modeling: Neural computation/mental connections. In L. Nadel (Ed.), P. Culicover, L. A. Cooper, R. M. Harnish (Assoc. Eds.), *Neural connections, mental computation*. Cambridge, MA: MIT Press/Bradford. 49–67. [Reprinted in J. Haugeland, (Ed.). 1997. *Mind Design II: Philosophy, Psychology, Artificial Intelligence*, MIT Press/Bradford Books.]
- [109] Smolensky, P. 1987. On the connectionist reduction of conscious rule interpretation. *Proceedings of the Ninth Conference of the Cognitive Science Society*. Seattle, WA. July. 187–94.
- [110] Smolensky, P. 1987. The constituent structure of connectionist mental states: A reply to Fodor and Pylyshyn. *Southern Journal of Philosophy*, **26** (Supplement), 137–63. [Reprinted in T. Horgan & J. Tienson (Eds.), 1991, *Connectionism and the Philosophy of Mind*, Dordrecht: Kluwer Academic. 281–308; Spanish translation in E. Rabossi (Ed.), *Filosofía y Ciencia Cognitiva*, Buenos Aires-Barcelona: Editorial Paidós.]

Integrative

- [111] Smolensky, Paul. 2006. Harmony in linguistic cognition. In the Special Issue Honoring 2005 D. E. Rumelhart Prize Recipient Paul Smolensky. *Cognitive Science* 30, 779–801.
- [112] Smolensky, Paul & Legendre, Géraldine. 2006. Harmony optimization and the computational architecture of the mind/brain. In [1]. Chapter 1. Vol. 1, 3–61.
- [113] Smolensky, Paul & Legendre, Géraldine. 2006. Principles of the Integrated Connectionist/Symbolic cognitive architecture. In [1]. Chapter 2. Vol. 1, 63–97.
- [114] Smolensky, Paul & Legendre, Géraldine. 2006. Formalizing the principles I: Representation and processing in the mind/brain. In [1]. Chapter 5. Vol. 1, 147–205.

- [115] Smolensky, Paul & Legendre, Géraldine. 2006. Formalizing the principles II: Optimization and grammar. In [1]. Chapter 6. Vol. 1, 207–234.
- [116] Soderstrom, Melanie, Mathis, Donald W. & Smolensky, Paul. 2006. Abstract genomic encoding of Universal Grammar in Optimality Theory. In [1]. Chapter 21. Vol. 1, 403–471.
- [117] Smolensky, P., Legendre, G., & Miyata, Y. 1993. Integrating connectionist and symbolic computation for the theory of language. *Current Science* **64**, 381–391. Reprinted in: V. Honavar & L. Uhr, *Artificial Intelligence and Neural Networks: Steps Toward Principled Integration*, 509–530. Academic Press.
- [118] Smolensky, P., Legendre, G., & Miyata, Y. 1992. Principles for an Integrated Connectionist/Symbolic Theory of Higher Cognition. Technical Report CU-CS-600-92, Department of Computer Science and 92-8, Institute of Cognitive Science. University of Colorado at Boulder. (75 pages). Expanded to [2].
- [119] McNaughton, B. L. & Smolensky, P. 1991. Connectionist and neural modeling: Converging in the hippocampus. In R. G. Lister & H. J. Weingartner (Eds.), *Perspectives on Cognitive Neuroscience*. Oxford University Press. 93–109.
- [120] Smolensky, P. 1990. In defense of PTC: Reply to continuing commentary. *The Behavioral and Brain Sciences*. **13**, 407–411.
- [121] Smolensky, P. 1988. Putting Together Connectionism—again. *The Behavioral and Brain Sciences*, **11**, 59–74.
- [122] Smolensky, P. 1988. On the proper treatment of connectionism. *The Behavioral and Brain Sciences*, **11**, 1–23. [Reprinted in D. Cole, J. Fetzer, & T. Rankin (Eds.), 1990, *Philosophy, Mind, and Cognitive Inquiry*, Dordrecht: Kluwer Academic; A. I. Goldman, 1994, *Readings in Philosophy and Cognitive Science*, Cambridge: MIT Press/Bradford Books; and C. Macdonald & G. Macdonald (Eds.), 1995, *Connectionism: Debates on Psychological Explanation, Volume Two*, Oxford: Basil Blackwell; Italian translation published as monograph, *Il connessionismo* [7]; Hungarian translation in *A Cognitive Science Reader*, Budapest: Osiris Publishing House, 1997; French translation, *Le traitement approprié du connexionnisme*, in *Philosophie de l'esprit : Textes fondamentaux*, D. Fisette & P. Poirier (Eds.). Paris : J. Vrin, 2003.]
- [123] Smolensky, P. 1987. Connectionist AI, symbolic AI, and the brain. *Artificial Intelligence Review*, **1**, 95–109. [French translation with added post scriptum in D. Andler, (Ed.). 1992. *Introduction aux sciences cognitives*, Editions Gallimard.]
- [124] Smolensky, P. 1987. Connectionism and implementation: Commentary on J. R. Anderson, Methodologies for studying human knowledge. *The Behavioral and Brain Sciences*, **10**.

Other

- [125] Bernstein, B., Smolensky, P., & Bell, B. 1989. Design of a constraint-based hypertext system to augment human reasoning. *Proceedings of the Rocky Mountain Conference on Artificial Intelligence*. Denver, CO. June.
- [126] Smolensky, P., Fox, B., King, R., Lewis, C. 1988. Computer-aided reasoned discourse, or, How to argue with a computer. In R. Guindon (Ed.), *Cognitive Science and Its Applications For Human-Computer Interaction*. Hillsdale, NJ: Erlbaum. 109–62.
- [127] Smolensky, P. 1988. A design for Hype: A hypertext system for oral presentations. Technical Report, Xerox Palo Alto Research Center, Intelligent Systems Laboratory. February.
- [128] Smolensky, P., Bell, B., Fox, B., King, R., & Lewis, C. 1987. Constraint-based hypertext for argumentation. *Proceedings of Hypertext-87*. Chapel Hill, NC. November. 215–245.
- [129] Smolensky, P., Monty, M. L. & Conway, E. 1984. Formalizing task descriptions for command specification and documentation. *Proceedings of the International Federation of Information Processing Conference on Human-Computer Interaction*. London, England. September. 603–609.

- [130] Greenspan, S. & Smolensky, P. 1984. DESCRIBE: Environments for Specifying Commands and Retrieving Information By Elaboration. In User centered system design, Part II, Technical Report No. 8402. Institute for Cognitive Science, University of California at San Diego. March.
- [131] O'Malley, C., Smolensky, P., Bannon, L., Conway, E., Graham, J., Sokolov, J., & Monty, M. L. 1983. A proposal for user centered system documentation. *Proceedings of the CHI 1983 Conference on Human Factors in Computing Systems*. Boston, MA. December.
- [132] Freedman, B., Smolensky, P., & Weingarten, D. H. 1982. Monte Carlo evaluation of the continuum limit of $(\phi^4)_4$ and $(\phi^4)_3$ field theory. *Physics Letters B*, **113**, 481-486.
- [133] Smolensky, P. 1981. *Lattice Renormalization of ϕ^4 Theory*. Doctoral thesis in mathematical physics, Indiana University.
- [134] Bradbury, K., Danziger, S., Smolensky, E., & Smolensky, P. 1979. Public assistance, female headship and economic well-being. *Journal of Marriage and the Family*, 519-535. [Reprinted in G. McDonald & F. Nye (Eds.), 1979, *Family policy, National Council on Family Relations*.]
- [135] Cicchetti, C., Gillen, W., & Smolensky, P. 1977. *The Marginal Cost and Pricing of Electricity: An Applied Approach*. Ballinger.

GRANTS

- Smolensky, P., P.I.; Frank, R., Jelinek, F., Landau, B., Legendre, G., co-P.I.s. Unifying the science of language. Integrated Graduate Education and Research Training Program, NSF. 5/15/06-4/30/11. \$3,143,514.
- Smolensky, P., P.I.; Badecker, W., Brent, M., Burzio, L., Frank, R., Jusczyk, P., Legendre, G., Rapp, B., Vainikka, A. co-P.I.s. Problem-centered research training: Integrating formal and empirical methods in the cognitive science of language. Integrated Graduate Education and Research Training Program, NSF. 8/99-7/04. \$3,044,791.
- Smolensky, P., P.I.; Brent, M., Brill, E., Frank, R., Jusczyk, P., Legendre, G., Prince, A., Stevenson, S., & Yarowsky, D., co-P.I.s. Optimization in language and language learning. Learning and Intelligent Systems Initiative, Knowledge Models and Cognitive Systems Program, NSF. 7/97-6/03. \$824,709
- Smolensky, P., P.I.; Legendre, G., co-P.I. Integration of Connectionist and Symbolic Computation for Linguistic Modeling. Knowledge Models and Cognitive Systems Program, NSF. 1/93 - 6/96. \$237,489.
- Smolensky, P., P.I.; Legendre, G., co-P.I. Towards an Integrated Connectionist/Symbolic Theory of Higher Cognition. Linguistics Program, Human Cognition and Perception Program, and Cognitive Science Initiative, NSF. 8/92 - 7/94. \$112,000.
- Smolensky, P., P.I.; Legendre, G., co-P.I. Towards an Integrated Connectionist/Symbolic Theory of Higher Cognition: Research Experiences for Undergraduates Supplement. 1993.
- Mozer, M. C., P.I.; Smolensky, P., co-P.I. Connectionist Models Summer School. Cognitive Science Initiative and Knowledge Models and Cognitive Systems Program, NSF. 4/93 - 3/94. \$30,000.
- Prince, A., Smolensky, P., P.I.s. Universal phonology through harmony theory. Small Grant for Exploratory Research, Linguistics Program, NSF. 8/90 - 7/91. \$20,000.
- Smolensky, P., recipient. Gift for support development of the EUCLID system. Apple Computer, Inc. 9/90 - 9/91. \$30,000.
- Schnabel, R., P.I.; King, R., Lewis, C., Main, M., Nutt, G., Smolensky, P., co-P.I.s. Effective use of parallel and distributed computing. Institutional Infrastructure Program, NSF. 9/90 - 8/95. \$1,800,000.
- Smolensky, P. P.I.; Fox, B., King, R., Lewis, C., co-P.I.s. Computer-aided reasoned discourse: the EUCLID system. Interactive Systems Program, Computer and Information Science and Engineering Directorate, NSF. 4/87 - 9/90. \$490,458.
- Smolensky, P. Investigator, Optical Connectionist Machine Program. NSF Engineering Research Center for Optoelectronic Computing Systems. 5/87 - 4/92. \$14,500,000.

- McNaughton, B., Nadel, L., O'Keefe, J., & Smolensky, P., co-P.I.s. Spatial computation in the mammalian hippocampal formation. Computational Neuroscience Program, Sloan Foundation. 2/87 - 2/90. \$200,000.
- Smolensky, P., P.I. Inference in massively parallel artificial intelligence systems. Information Science Program, Information Science and Technology Division, NSF. 8/86 - 7/89. \$136,660.
- Smolensky, P., P.I.; Anderson, D. Z., Cohen, M., Feinberg, J., co-P.I.s. Distributed processing in continuous optical media. Lightwave Technology Program, Engineering Division, NSF. 9/87 - 2/89. \$88,625.
- Smolensky, P., P.I. Support for research on connectionism and the EUCLID system. Symbolics, Inc. 9/86 - 8/89. \$18,000.

PROFESSIONAL ACTIVITIES

Invited Presentations

2010

- Symposium '10 years of the Rumelhart Prize', Annual Meeting of the Cognitive Science Society, Portland. Conférence de clôture, Chaire Blaise Pascal, Paris.
- Colloquium, Cognitive Science Program, University of Arizona.
- Colloquium, Cognitive Science Program, Yale University.

2009

- Master class, Royal Netherlands Academy of Arts and Science. (With Géraldine Legendre.)
- Master class, Royal Netherlands Academy of Arts and Science.
- Royal Netherlands Academy of Arts and Science Workshop on Language Acquisition and Optimality Theory, Amsterdam. (With Géraldine Legendre.)
- Royal Netherlands Academy of Arts and Science Workshop on Language Acquisition and Optimality Theory, Amsterdam.
- Colloquium, Max Planck Institute for Psycholinguistics, Nijmegen.
- Plenary speaker, Generative Linguistics in the Old World Conference, Nantes.
- Colloquium, Linguistics Society, Cambridge University.
- Colloquium, Department of Experimental Psychology, Oxford University.
- Laboratory of Cognitive Science and Psycholinguistics, Ecole Normale Supérieure, Paris.

2008

- 'Author meets critic' session on *The Harmonic Mind* (Smolensky & Legendre, MIT Press, 2006), American Philosophical Association Eastern Division Annual Conference, Philadelphia.
- Colloquium, Département d'Etudes Cognitives, Ecole Normale Supérieure, Paris.
- Laboratory for Language and Speech, University of Provence, Aix-en-Provence. Ecole d'Automne de Linguistique, Ecole Normale Supérieure, Paris.
- Workshop on Dynamical Systems in Language, Reading, UK.
- Connecting probabilistic models of cognition and neural networks, Berkeley.
- Language Production Workshop, Annapolis.
- Language and Neurons -Theoretical Approaches, Ramat-Gan, Israel.
- Workshop on Building Integrated Models of Linguistic Change, Santa Fe Institute.

2007

- Workshop on Variation, Gradience and Frequency in Phonology, Stanford University.
- Keynote Address, 25th anniversary celebration of the official founding of the Cognitive Science Program, Vassar College.

Linguistics Colloquium, Northwestern University.

2006

Workshop on Gaps in Paradigms, Oslo.

Inaugural Glushko Distinguished Visitor in Cognitive Science Program, UCSD.

Workshop on Language and the Origins of Humans, San Diego.

Linguistics Colloquium, Stanford University.

2005

Rumelhart Prize Lecture, Cognitive Science Society, Stresa.

Plenary speaker, Chicago Linguistic Society, Chicago.

Workshop on Perception in Phonology, Köln.

2004

Amsterdam Colloquium.

Amsterdam Fall Master Classes.

Linguistics Symposium, University of North Carolina.

Linguistics Colloquium, University of Southern California.

2003

Semantics Colloquium. Nijmegen, Netherlands.

Plenary speaker, Southwestern Optimality Theory Conference.

Workshop on Neural Networks, Logic, and Optimality Theory, Berlin.

Distinguished speaker series, University of Amsterdam.

Workshop on Markedness and the Lexicon. MIT.

2002

Seoul National University (two lectures).

Korean Phonological Society, Seoul.

North American Summer School for Logic, Language, and Information. Stanford University.

Plenary speaker, Annual Meeting of the Linguistic Society of America, San Francisco.

Linguistics Colloquium, Rutgers University.

2001

Phonology Forum, Tokyo.

Optimality Theory Workshop, Tokyo.

Plenary speaker, International Cognitive Science Conference, Beijing.

Presidential Address, Annual Meeting of the Society for Philosophy and Psychology, Cincinnati.

Invited organizer and speaker, Symposium on the Mathematics of Optimality Theory, Annual Meeting of the American Association for the Advancement of Science. San Francisco.

Cognitive Science Distinguished Speaker Series, Rochester University (two lectures).

Workshop on Language and Evolution, Institute for Advanced Study, Princeton.

Plenary speaker, International Conference on Cognitive and Neural Systems, Boston University.

2000

Workshop on the Optimization of Interpretation. Utrecht, The Netherlands.

Linguistics Colloquium, UCLA.

1999

Invited speaker, Symposium on Optimality Theory. Annual Conference of the Cognitive Science Society, Vancouver.

Workshop on Neuronal Assemblies, International Joint Conference on Neural Networks, Washington, D.C.

Workshop on Phonology and the Lexicon, University of Alberta, Edmonton.

Plenary speaker, Inaugural Conference for the Program in Cognitive Science, University College Dublin.

Plenary speaker, 35th Annual Meeting of the Chicago Linguistics Society, Chicago.

Ida Cordelia Beam Distinguished Lecture, University of Iowa.

Linguistics Colloquium, University of Massachusetts at Amherst.

Physics Colloquium, Rutgers University.

1998

Is syntax different? Common cognitive structure for syntax and phonology in Optimality Theory, Stanford University.

Cognitive Science Round Table, Stanford University.

Linguistics Colloquium, Stanford University.

Linguistics Colloquium, New York University.

Linguistics Colloquium, Yale University.

Applied Physics Laboratory Colloquium, Johns Hopkins University.

Philosophy Colloquium, Johns Hopkins University.

1997

Plenary speaker, Computational Psycholinguistics Conference, Berkeley, CA.

Plenary speaker, Hopkins Optimality Theory Workshop/University of Maryland Mayfest.

Tutorial in Optimality Theory (for syntacticians and others), Hopkins Optimality Theory Workshop/University of Maryland Mayfest.

Plenary speaker, GALA Conference on Language Acquisition: Knowledge Representation and Processing, Edinburgh.

Center for Cognitive Science Colloquium, Rutgers University.

Optimality Theory Research Seminar, Rutgers University.

1996

Workshop on Optimality Theory and Cognition, Stanford University.

Invited organizer/moderator, Symposium on Controversies in Cognitive Science: The Case of Language. Cognitive Science Society, San Diego.

Plenary speaker, Celebration of the 10th anniversary of publication of the PDP books, Cognitive Science Society, San Diego.

Invited organizer, discussant and speaker, Symposium on Non-symbolic Computation, Society for Philosophy and Psychology, San Francisco.

University of California at San Diego Cognitive Science Distinguished Speaker Series.

Vassar College Cognitive Science Speaker Series.

Linguistics Colloquium, Stanford University.

Language Acquisition Seminar, Stanford University.

1995

Plenary speaker, Conference of the Computational Linguistics Special Interest Group of the German Linguistics Society, Düsseldorf.

Plenary speaker, Conference on Current Trends in Phonology: Models and Methods, Royaumont/Paris.

Plenary speaker, Conference on Optimality in Syntactic Theory, MIT.

Cognitive Studies Speaker Series, Cornell University.
Linguistics Colloquium, Cornell University.
Computer Science Colloquium, Rutgers University.
Colloquium, Program in Cognitive Science and Linguistics, MIT.
Linguistics Colloquium, University of Arizona.
Linguistics Colloquium, University of Southern California.
Linguistics Colloquium, University of Maryland.
Colloquium, Institute for Research in Cognitive Science, University of Pennsylvania.
Linguistics Colloquium, University of California, Los Angeles.
Linguistics Colloquium, University of Delaware.

1994

Invited speaker, Annual Conference of the Cognitive Science Society, Atlanta.
Plenary speaker, First International Summer Institute in Cognitive Science, Buffalo, NY.
Plenary speaker, Annual Conference of the Association for Computational Linguistics.
Invited speaker, Annual Conference of the Society for Philosophy and Psychology, Memphis.
Workshop on Cognitive Models of Language Acquisition, Tilburg, The Netherlands.
Plenary speaker, CUNY Sentence Processing Conference, New York.
Colloquium, Department of Cognitive and Linguistic Sciences, Brown University.
Psychology Colloquium, Yale University.
Linguistics Colloquium, University of California, Santa Cruz.
Cognitive Science Colloquium, Georgia Institute of Technology.

1993

Keynote Address, Rutgers Optimality Workshop-1, New Brunswick, NJ.
Plenary speaker, Annual Conference of the Cognitive Science Society, Boulder, CO.
Cognitive Science Colloquium, University of Massachusetts at Amherst.
Cognitive Science Colloquium, University of Minnesota, Twin Cities.
Cognitive Science Colloquium, New York University.
Phonology Workshop, Stanford University.

1992

NSF Workshop on Approaches to AI, Santa Fe, NM.
Plenary speaker, International Symposia on Information Sciences, Fukuoka, Japan.
Plenary speaker, Conference on Cognition and Representation, Buffalo, NY.
Keynote address, West Coast Conference on Formal Linguistics XI, Los Angeles.
Rutgers Center for Cognitive Science Colloquium, Rutgers University.
International Computer Science Institute, Berkeley, CA.
Colloquium, Phonology Laboratory, Linguistics Department, University of California, Berkeley.
Department of Computer and Cognitive Sciences, Chukyo University, Toyota, Japan.
Electro-Technical Laboratory, Tsukuba, Japan.
Nippon Telephone and Telegraph, Yokosuka, Japan.
Colloquium, Cognitive Science Program, University of Rochester.
Colloquium, Department of Computer Science, State University of New York at Buffalo.
Colloquium, Institute for Research in Cognitive Science, University of Pennsylvania.
Colloquium, Cognitive Science Program, University of California at Berkeley.

1991

Plenary speaker, Royal Society Conference on Hybrid Models of Cognition: The Problems of, and Requirements for, Combining the Use of Subsymbolic and Symbolic Computing, London.
Plenary speaker, Scandinavian Conference on Artificial Intelligence, Roskilde, Denmark.
Plenary speaker, CUNY Sentence Processing Conference, Rochester, NY.
Connectionism and cognitive science workshop, Cognitive Science Program, Vassar College.
Interdisciplinary Workshop on Compositionality in Cognition and Neural Models, Royaumont/Paris.
Plenary speaker, Arizona Phonology Conference, Tucson.
Harmonic phonology workshop, Cognitive Science Program, University of Arizona, Tucson.
Parallel Distributed Processing Seminar, Stanford University.
Colloquium, Center for the Study of Language and Information, Xerox PARC/Stanford University.

1990

Plenary speaker, Symposium on Neural Networks, Linz, Austria.
Artificial Intelligence and Cybernetics Speaker Series, University of Vienna.
Workshop on Language: With or without rules? Questions from Universal Grammar, Cognitive Grammar, and Connectionism, Durham, NH.
Workshop on Iconic and Symbolic Representations in Mental Models, MIT.
University Lecture Series, Memphis State University.
Program in Cognitive Science Speaker Series, University of North Carolina, Chapel Hill.
Colloquium, Institute of Cognitive Science, University of Colorado at Boulder.
Colloquium, Center for Research on Language, UCSD.

1989

Colloquium, Center for Complex Cognitive, Neural, and Computational Systems, Brandeis University.
International Symposium on Synergetics of Cognition, Elmau, West Germany.
Cognitive Science Speaker Series, Indiana University, Bloomington.
Colloquium, International Computer Science Institute, Berkeley.
Seminar in Connectionist and Neural Models, University of Chicago.

1988

Workshop: Connectionism in Perspective, Zurich.
Colloquium, International Computer Science Institute, Berkeley.
Parallel Distributed Processing Seminar, University of Pennsylvania.
Colloquium, Optoelectronic Computing Systems Center, University of Colorado, Boulder.
Plenary speaker, Neuro-Image Conference, Bordeaux.
Invited speaker, Symposium on Connectionism and Psychological Explanation, Society for Philosophy and Psychology Conference, Chapel Hill, NC.
Invited speaker, Symposium on Parallel Distributed Processing in Man and Machine, European Meeting on Cybernetics and Systems Research, Vienna.
Workshop on Parallel Distributed Processing of Language, Vienna.
Invited debater, Program in Cognitive Science, MIT.
Sloan Cognitive Science Speaker Series, University of Pennsylvania.

1987

Plenary speaker, Spindel Philosophy Conference on Connectionism and the Philosophy of Mind, Memphis, TN.
Plenary speaker, Annual Meeting of the Society for Mathematical Psychology, Berkeley, CA.
Plenary speaker, Symposium on Cognitive Science, Cerisy-la-Salle, France.

New Directions in the Philosophy of Cognitive Science Speaker Series, University of Minnesota.
Plenary speaker, Symposium on Connectionism, University of Toronto.
Human Factors in Computing Systems and Graphics Interfaces Conference, Toronto.
Colloquium, Program in Cognitive Science, Princeton University.
Colloquium, Department of Brain and Cognitive Sciences, MIT.
Cognitive Science Colloquium, University of Illinois.
Colloquium, Department of Computer Sciences, University of Pennsylvania.
Colloquium, Center for Research in Learning, Cognition, and Perception, University of Minnesota.
Seminar in Mathematical Approaches to Language, Linguistic Institute, Stanford University.
Parallel Distributed Processing Research Group, Stanford University.

1986

Colloquium, Program in Cognitive Science, University of California at Berkeley.
Invited speaker, Symposium on Connectionist Models and Neural Networks, Society for Philosophy and Psychology Conference, Baltimore, MD.
Invited speaker, Symposium on Cognitive Science: Theory, Methodology, and Applications, American Association for the Advancement of Science, Southwest and Rocky Mountain Division Annual Meeting, Boulder, CO.
Plenary speaker, Neural Connections/Mental Computation: Conference on Biological Computation, Tucson, AZ.
Colloquium, Max Planck Institute for Psychiatry, Munich.
Computer Science Colloquium, University of Arizona.
Colloquium, Computing Research Laboratory, New Mexico State University.
Seminar in Expert Systems, University of California at Berkeley.
University of California at Berkeley, Seminar in Neural Nets and Parallel Computation.
University of California at Berkeley, Seminar in Cognitive Modeling.
Xerox Palo Alto Research Center, Intelligent Systems Laboratory.

1985

Computer Science Colloquium, UCSD.
Colloquium, MCC, Austin, TX.
Information and Computer Sciences Colloquium, University of California at Irvine.
Colloquium, Division of Education in Mathematics, Technology and Science, University of California at Berkeley.
Computer Science Colloquium, University of Colorado, Boulder.
Colloquium, Philips Laboratories, New York.

1984

Invited speaker, Symposium on Ethical Issues in New Computing Technologies, National Conference of the Association for Computing Machinery, San Francisco.
Workshop on Parallel Distributed Processing, La Jolla, CA.
Workshop on Stochastic Parallel Computation, Boston.
Colloquium, Brown University Applied Mathematics Department.
Colloquium, MIT Artificial Intelligence Laboratory.
Seminar, Carnegie-Mellon Boltzmann Machine Research Group.
Colloquium, University of Pittsburgh Learning Research and Development Center.
Seminar, University of Massachusetts Adaptive Systems Research Group.
Colloquium, Max Planck Institute for Psychiatry, Munich.
Colloquium, European Centre for Research in Computing, Munich.

Other International Invitations (declined)

- Professor, Eastern European Generative Grammar summer school; Constanza, Romania, July – August, 2010.
- Invited speaker, Workshop: What Should Psychology as a Basic Science Aim For? Strengths and Limitations of Theoretical Explanations in Psychology; Nierstein, Germany, December, 2009.
- Invited speaker, Eighth International Tbilisi Symposium on Language, Logic and Computation, Bakuriani, Georgia, September, 2009.
- Invited speaker, Interdisciplinary Seminar Series of the School of Philosophy, Psychology and Language Sciences, Edinburgh University, May, 2009.
- Invited speaker, Workshop on learning about vocal structure, Leiden, Netherlands, April, 2009.
- Invited speaker, Seventh International Tbilisi Symposium on Language, Logic and Computation, Tbilisi, Georgia, October, 2007.
- Invited speaker, 45th Annual Meeting of the Association for Computational Linguistics, Prague, June, 2007.
- Invited speaker, Sixth International Tbilisi Symposium on Language, Logic and Computation, Batumi, Georgia, September, 2005.
- Invited instructor, Summer School on Complex Networks in Brain Dynamics, International Helmholtz Institute for Supercomputational Physics, Potsdam, September, 2005.
- Invited speaker, Réseau Français de Phonologie, Aix-en-Provence, June 2004.
- Invited speaker, Sixth Workshop on Optimality Theory Syntax. Potsdam. October, 2002.
- Invited speaker, GLOW Workshop on First and Second Language Acquisition, Utrecht, 12–13 April, 2002.
- Invited speaker, First Salzburg Workshop on Paradigms of Cognition, Salzburg University, Salzburg, Austria, July, 2002.
- Keynote speaker, Cognitive Linguistics Conference, Graduate Institute of Linguistics, National Chengchi University, Taiwan, January, 2002.
- Invited speaker, Cognitive Science Conference, California State University, Long Beach, April, 2002.
- Invited speaker, Fifth International Conference on Computational Intelligence, Symposium on New Frontiers for Recurrent Neural Networks, Research Triangle Park, NC, March 2002.
- Invited speaker, Scuola Superiore G. Reiss Romoli Winter Conference, L'Aquila, Italy, January, 2002.
- Invited lecturer (3 lectures), Vilem Mathesius Lecture Series 17, Prague, March 2002.
- Invited speaker, International Symposium on Foundations and the Ontological Quest, Rome, Jan. 2002.
- Invited speaker, Early phonological acquisition Workshop, Vacanciel La Calanque, Carry-le-Rouet, France, Oct. 2001
- Invited speaker, Language, Abduction, And Computation Workshop, Canadian Philosophical Association Meeting, Québec, May 2001
- Faculty, Summer School in Linguistics, Girona, Spain, 2000
- Invited speaker, Workshop on conflicting rules, Potsdam University, Dec. 1999.
- Invited speaker, Economy in the Structure and Computation of Natural Language. Lyon, France. Oct. 1999.
- Invited speaker, Computationalism – The next generation. Vienna, May 1999.
- Invited speaker, Cognitive Science Tutorial Speaker Series, University of Delaware. 1998
- Invited speaker, Cognitive Science Distinguished Lecture Series, Carleton University, Ottawa. 1998.
- Invited speaker, Cognitive Science of Natural Language Processing. Dublin, August 1998.
- Organizing committee, Workshop on Computing Constraints, Annual Conference on Computational Linguistics, Montreal. August 1998.
- Invited speaker, Conference on Memory and Linguistics Processing, Utrecht, Holland. May 1998.
- Invited speaker, International Workshop on Approaches to Phonology, Abbaye de Royaumont, France. June 1998.
- Invited speaker, Conference on Connectionism and the Philosophy of Psychology, Ljubljana, Slovenia. August 1997.

- Invited speaker, Korean Conference on Cognitive Science. Seoul, August 1997.
- Invited speaker, Language and Cognition in Language Acquisition, Odense. Denmark, Aug. 1997.
- Invited speaker, Carnegie Symposium on Cognition. Pittsburgh, May 1997.
- Invited speaker, Workshop on Conflicting Constraints, Groningen, The Netherlands. July, 1996.
- Faculty, Behavioral and Cognitive Neurosciences International Summer School, Groningen, The Netherlands. July, 1996.
- Invited speaker, Workshop on Dynamics, Computation, and Cognition, Santa Fe Institute. May, 1996.
- Faculty, Summer School in Cognitive Science, New Bulgarian University, Sofia, Bulgaria. July, 1996, 1995.
- Invited speaker, Conference on Recent Developments in Connectionism, Ottawa, June 1996.
- Invited contributor, Special Issue on Cognitive Science, *il cannocchiale: rivista di studi filosofici*, 1996.
- Editorial Board, *Cognition*, 1995–.
- Invited speaker, Workshop on Derivations and Constraints in Phonology, Colchester, England, September, 1995.
- Invited speaker, Linguistic Society of Korea; Korean Society for Cognitive Science. July 1995.
- International Program Committee, World Conference on the Fundamentals of Artificial Intelligence. Paris. July, 1995.
- Invited speaker, Fourth International Conference on Cognitive Science. San Sebastián, Spain. May, 1995.
- Optimality and processing in phonology. Processing Consequences of Phonological Diversity. Trieste, Italy. April, 1995.
- Invited speaker, Second Swedish Conference on Connectionism. March, 1995.
- International board of consulting editors, Human Cognitive Processing: An Interdisciplinary Series on Language and Other Mental Faculties, John Benjamins Publishing Co. February 1995.
- Advisory Board, *Handbook of Neural Computation*. Oxford/Institute of Physics Publishing. April, 1994.
- Invited speaker, Weizmann Institute Workshop on Immunology as a Cognitive Science, Rehovot, Israel. April 1994.
- Chair of session on Optimality Theory, Annual Meeting of the Linguistics Society of America, Boston, MA. January 1994.
- Invited talk and tutorial, International Conference on Neural Networks, Nagoya, Japan. October, 1993.
- Invited Speaker, Ludwig Wittgenstein Symposium: Philosophy and the Cognitive Sciences. Kirchberg/Wechsel, Austria. August 1993.
- Invited Speaker, Models of Cognition. Salernes, France. May, 1993.
- Invited Speaker, Perceptual Multistability and Semantic Ambiguity Workshop, Bremen, Germany. March 1993.
- Program Committee Member, IEEE International Conference on Neural Networks. San Francisco. March, 1993.
- Invited Speaker, Conference on Brain and Cognitive Processes. San Marino. December, 1992.
- Invited Speaker, Linguistics Society of Belgium. Antwerp, Belgium. November, 1992.
- Invited Speaker, First Swedish Conference on Connectionism. Skovde, Sweden. September, 1992.
- Invited Speaker, Workshop on Integrating Speech and Natural Language. Dublin, Ireland. July 1992.
- Invited Speaker, International Conference on the Holonomic Theory of Perception. Australia. July, 1992.
- Invited Speaker, Irish Neural Networks Conference. Belfast, Northern Ireland. June, 1992.
- Invited Speaker, Round-table on the continuum in Linguistic Semantics. Caen, France. June, 1992.
- Invited Speaker, Second Interdisciplinary Workshop on Compositionality in Cognition and Neural Models. Royaumont/Paris. June, 1992.
- Invited Speaker, 9th International Congress of Logic, Methodology and Philosophy of Science; Cognitive Science, Artificial Intelligence and Computational Psychology Section. Uppsala, Sweden. August, 1991.
- Invited speaker, Conference on Adaptive Learning and Neural Networks. Ulm, Germany. July, 1991.
- Invited Speaker, 2nd International Conference on Cognitive Science. San Sebastian, Spain. May, 1991.

- Keynote speaker, TEC-COMP 91, International Congress on New Horizons of Artificial Intelligence. Mexico City. April, 1991.
- Invited Speaker, Congress on Linguistic Engineering 91. Paris. January, 1991.
- Invited Speaker, Conference on Emergence, Supervenience, and Non-reductive Materialism. Zentrum für interdisziplinäre Forschung, Universität Bielefeld, Germany. October, 1990.
- Program Committee, Tutorial Speaker, and Invited Speaker, Cognitiva meeting. Madrid. October, 1990.
- Invited Speaker, Colloquium on Continuous Mathematics. Cerisy-la-Salle, France. September, 1990.
- Colloquium Speaker, Forschungsinstitut für anwendungsorientierte Wissensverarbeitung. Ulm, Germany. July, 1990
- Instructor, International Summer School in Philosophy and Artificial Intelligence. Bolzano, Italy. July, 1990.
- Invited Speaker, Turing Colloquium. University of Sussex, Brighton, England. April, 1990.
- Invited Participant, Mind and Brain symposium. Zentrum für interdisziplinäre Forschung, Universität Bielefeld, West Germany. December, 1989.
- Invited Speaker, Connectionism and language. The New University, San Marino, Italy. October, 1989.
- Invited Speaker, European Mathematical Psychology Meeting. Nijmegen, The Netherlands. August 1989.
- Invited Participant, Workshop on Connectionism. Birkbeck College, London. July 1989.
- Instructor, Eurotra Machine Translation Advanced Course Programme. Barcelona, Spain.
- Visiting Lecturer, University of Vienna.
- Visiting Lecturer, Institute of Cognitive Science, Beijing.

Contributed Conference Presentations

- Replicator dynamics of speech perception and categorization. Michael Wolmetz, Colin Wilson and Paul Smolensky. Poster presented at Laboratory Phonology 11, Wellington, New Zealand, June, 2008.
- Speakers' knowledge of phonological universals: Evidence from nasal clusters. Iris Berent, Tracy Lennertz, & Paul Smolensky. CUNY Conference on the Syllable. New York. January, 2008.
- Recoverability Optimality Theory: Discourse anaphora in a bidirectional framework. Paper presented at EDILOG, 6th Workshop on the Semantics and Pragmatics of Dialog, Edinburgh, UK. August 2002.
- Typological consequences of local constraint conjunction. 21st West Coast Conference on Formal Linguistics. April, 2002.
- A criterion for causal efficacy derived from Optimality Theory. American Philosophical Association Meeting, Midwest Division. May, 2001.
- Syntactic Influences in Relative Clause Attachment: An Optimality Theory Account. CUNY Sentence Processing Conference. Philadelphia, PA. March, 2001.
- Phonological processing deficits in aphasia. Cognitive Science Society. Philadelphia, PA. August, 2000.
- Implementing the dual route in a single route. Cognitive Science Society. Vancouver. August, 1999.
- Optimality in sentence processing. Computational Psycholinguistics. Berkeley, CA. August, 1997.
- Optimal sentence processing. Hopkins Optimality Theory Workshop/University of Maryland Mayfest. May, 1997.
- The learnability of Optimality Theory. West Coast Conference on Formal Linguistics. San Diego, CA. February, 1994.
- Analytic typology of case marking and grammatical voice based on hierarchies of universal constraints. Berkeley Linguistics Society. Berkeley, CA. February, 1993.
- Harmonic Grammars for formal languages. Neural Information Processing Systems. Denver, CO. December, 1992.
- Harmonic Grammar: A progress report on connectionist mathematical linguistics. Third Conference on the Mathematics of Language. Austin, TX. November, 1992.
- Rule induction through integrated symbolic and subsymbolic processing. Neural Information Processing Systems. Denver, CO. December, 1991.
- The connectionist scientist game: Rule extraction and refinement in a neural network. Cognitive Science Society. Chicago, IL. July, 1991.

- Learning explicit rules in a neural network. International Joint Conference on Neural Networks. Seattle, WA. July, 1991.
- Unifying syntactic and semantic accounts of unaccusativity: A connectionist approach. Berkeley Linguistics Society. Berkeley, CA. February, 1991.
- Recursive structure processing and Harmonic Grammar. Neural Information Processing Systems. Denver, CO. November, 1990.
- Harmonic Grammar – A formal multi-level connectionist theory of linguistic well-formedness: An application. Cognitive Science Society. Cambridge, MA. July, 1990.
- Harmonic Grammar – A formal multi-level connectionist theory of linguistic well-formedness: Theoretical foundations. Cognitive Science Society. Cambridge, MA. July, 1990.
- Can connectionism contribute to syntax? Chicago Linguistics Society. Chicago, IL. April, 1990.
- Virtual memories and massive generalization in connectionist combinatorial learning. Cognitive Science Society. Ann Arbor, MI. August, 1989.
- Skeletonization: Trimming the fat from a network via relevance assessment. Neural Information Processing Systems. Denver, CO. November, 1988.
- Application of the interactive activation model to document retrieval. Neuro-Nîmes: Neural networks and their applications. Nîmes, France. November, 1988.
- Analyzing a connectionist model as a system of soft rules. Cognitive Science Society. Montreal, Canada. August, 1988.
- Analysis of distributed representation of constituent structure in connectionist systems. IEEE Conference on Neural Information Processing Systems: Natural and Synthetic. Denver, CO. November, 1987.
- On the connectionist reduction of conscious rule interpretation. Cognitive Science Society. Seattle, WA. July, 1987.
- Statistical mechanics and parallel computation. La Jolla Institute Center for Studies of Nonlinear Physics Dynamics Days. La Jolla, CA. January, 1985.
- Parallel computation: The brain and artificial intelligence. Southern California Artificial Intelligence Society. Los Angeles, CA. October, 1984.
- Formalizing task descriptions. International Federation for Information Processing Conference on Human-Computer Interaction. London, England. September, 1984.
- A parallel model of problem solving. Cognitive Science Society. Boulder, CO. June, 1984.
- The mathematical role of self-consistency in parallel computation. Cognitive Science Society. Boulder, CO. June, 1984.
- User-centered system documentation. Human Factors in Computer Systems. Boston, MA. December, 1983.
- Schema selection and stochastic inference in modular environments. National Conference on Artificial Intelligence. Washington, DC. August, 1983.
- Cognitive temperature and learning in connectionist models. Cognitive Science Society. Rochester, NY. May, 1983.

Service to National Scientific Organizations

- NIH Training Grant Panel, Cognitive Neuroscience, 2003, 2004
- National Academy of Sciences/Institute of Medicine Workshop, Opportunities for Interdisciplinary Training, Invited Speaker, 1999
- NSF Science and Technology Center Program site visit team member, 1996
- NSF Workshop on Learning and Intelligent Systems Initiative Team Leader, 1995
- NSF Young Investigator Award Panel, 1993
- NSF Workshop on Approaches to AI, 1993
- NSF Cognitive Science Initiative Workshop, 1991
- NSF Science and Technology Center Program panel member and site visit team chairman, 1990
- NSF Institutional Infrastructure Program site visit team member, 1989
- NSF Workshop on Connectionism and Cognitive Science, 1986

University Service

Brain and Behavioral Sciences Advisory Committee
 Krieger-Eisenhower Chair Selection Committee
 Anthropology Department Senior Search Committee
 Undergraduate Writing Requirement Evaluation Committee
 Ad hoc promotion/appointment committees: Computer Science, Anthropology, Psychology

Courses Developed

Itô calculus half-course
 Axiomatic Linguistics: Exemplars and compositionality (with Robert Frank). Spring 2008.
 Professional Seminar in Cognitive Science (with Barbara Landau). Spring 2008.
 Learning Theory (with Robert Frank). Spring 2007.
 Seminar in Experimental and Processing Linguistics. Fall 2006.
 Multidisciplinary seminar in phonology. Fall 2005.
 Foundations of cognitive science B. Spring 2004.
 Introduction to cognitive science for mathematical scientists. Fall 2003.
 Phonology III. Spring 2003.
 Intermediate formal methods in cognitive science: neural networks. Fall 2002.
 Seminar: Competence and performance in cognitive science. Spring 2001.
 Formal methods in cognitive science: Neural networks. Fall 1998.
 Phonology II. Spring 1997.
 Phonology I. Fall 1996; Fall 2004.
 Minds, brains, and computers. Spring 1996.
 Seminar in Optimality Theoretic phonology. Spring 1995.
 Seminar in Optimality Theory and connectionism in linguistics. Spring 1994.
 Computation for cognitive scientists (for non-computer-science graduate students). Spring 1993.
 Mathematical perspectives on neural networks. Spring 1991.
 Modules for Introduction to AI: Logic; Cognitive Modeling; Machine Learning. Fall 1990.
 Foundations of cognitive science. Fall 1989.
 Advanced seminar in connectionist modeling. Spring 1988.
 Topics in cognitive science: Connectionism; Formal Syntax. Spring 1988.
 Survey of cognitive science. Fall 1987.
 Introduction to connectionist AI. Spring 1986.
 Advanced AI programming. Fall 1985.

Doctoral Thesis Supervision

Primary advising

Oliver, Michael. Department of Cognitive Science, Johns Hopkins University. Expected 2012.
 Culbertson, Jennifer. *Learning biases, regularization, and the emergence of typological universals in syntax*. Department of Cognitive Science, Johns Hopkins University. Expected 2010. (Co-advisor: Géraldine Legendre)
 Finley, Sara. *Formal and Cognitive Restrictions on Vowel Harmony*. Department of Cognitive Science, Johns Hopkins University. 2008.
 Morley, Rebecca L. *Generalization, Lexical Statistics, and Typologically Rare Systems*. Department of Cognitive Science, Johns Hopkins University. 2008.
 Jarosz, Gaja. *Rich Lexicons and Restrictive Grammars – Maximum Likelihood Learning in Optimality Theory*. Department of Cognitive Science, Johns Hopkins University. 2006.

- Buchwald, Adam. *Sound Structure Representation, Repair and Well-Formedness: Grammar in Spoken Language Production*. Department of Cognitive Science, Johns Hopkins University. 2005. (Co-advisor: Brenda Rapp)
- Hale, John. *Grammar, Uncertainty and Sentence Processing*. Department of Cognitive Science, Johns Hopkins University. 2003.
- Davidson, Lisa. *The Interaction of Articulatory, Perceptual, and Temporal Elements in Consonant Cluster Production*. Department of Cognitive Science, Johns Hopkins University. 2003.
- Tesar, Bruce. *Computational Optimality Theory*. Department of Computer Science, University of Colorado. 1995.
- Lynn, Patrick. *System Interaction in Human Memory and Amnesia: Theoretical Analysis and Connectionist Modeling*. Department of Computer Science, University of Colorado. 1994.
- Bernstein, Bernard. *EUCLID Supports Informal Argumentation with Hypertext*. Department of Computer Science, University of Colorado. 1993.
- Brousse, Olivier. *Systematicity and Generativity in Neural Network Combinatorial Learning*. Department of Computer Science, University of Colorado. 1991.
- Sanger, Dennis. *Contribution Analysis: A Technique for Assigning Responsibilities to Hidden Units in Connectionist Networks*. Department of Computer Science, University of Colorado. 1990.

Secondary advising

- Nicol, Tamara. *Learning Which Verbs Allow Object Omission: Verb Semantic Selectivity and the Implicit Object Construction*. Department of Cognitive Science, Johns Hopkins University. 2007. (Primary advisors: Barbara Landau, Géraldine Legendre)
- Goldrick, Matthew. *Patterns in Sound, Patterns in Mind: Phonological Regularities in Speech Production*. Department of Cognitive Science, Johns Hopkins University. 2002. (Primary advisor: Brenda Rapp)
- Wilson, Colin. *Targeted Constraints: An Approach to Positional Neutralization in Optimality Theory*. Department of Cognitive Science, Johns Hopkins University. 2000. (Primary advisor: Luigi Burzio)
- Gafos, Diamandis. *The Articulatory Basis of Locality in Phonology*. Department of Cognitive Science, Johns Hopkins University. 1996. (Primary advisor: Luigi Burzio)
- McMillan, Clayton. *Rule Induction in a Neural Network through Symbolically Constrained Subsymbolic Processing*. Department of Computer Science, University of Colorado. 1992. (Primary advisor: Michael Mozer)