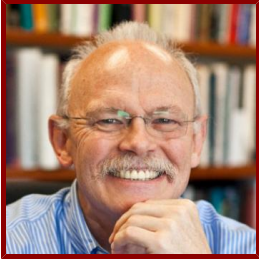


Stanford



Jay McClelland

Lucie Stern Professor in the Social Sciences, Professor of Psychology and, by courtesy, of Linguistics and of Computer Science

CONTACT INFORMATION

- **Alternate Contact**

Reneé Rittler - Administrative Services Manager

Email rittler@stanford.edu

Tel 6507237431

Bio

ACADEMIC APPOINTMENTS

- Professor, Psychology
- Professor (By courtesy), Linguistics
- Professor (By courtesy), Computer Science
- Member, Bio-X
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)
- Member, Wu Tsai Human Performance Alliance
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Professor, Department of Psychology, (2006- present)
- Director, Center for Mind, Brain, Computation and Technology, (2006- present)

HONORS AND AWARDS

- Distinguished Scientific Contribution Award, American Psychological Association (1996)
- Member, National Academy of Sciences (2001-)

PROGRAM AFFILIATIONS

- Symbolic Systems Program

PROFESSIONAL EDUCATION

- Ph. D., University of Pennsylvania, Cognitive Psychology (1975)

LINKS

- Jay McClelland's Home Page: <https://stanford.edu/~jlmcc/>
- Center for Mind, Brain, Computation and Technology: <https://neuroscience.stanford.edu/mbct/home>

- PDP Lab: <http://web.stanford.edu/group/pdplab/index.html>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research addresses topics in perception and decision making; learning and memory; language and reading; semantic cognition; and cognitive development. I view cognition as emerging from distributed processing activity of neural populations, with learning occurring through the adaptation of connections among neurons. A new focus of research in the laboratory is mathematical cognition and reasoning in humans and contemporary AI systems based on neural networks.

Please visit my web page for more information.

Teaching

COURSES

2023-24

- Neural Network Models of Cognition: PSYCH 209 (Win)

2022-23

- Foundations of Cognition: PSYCH 205 (Spr)
- Neural Network Models of Cognition: PSYCH 209 (Win)

2021-22

- Neural Network Models of Cognition: PSYCH 209 (Win)

2020-21

- Foundations of Cognition: PSYCH 205 (Spr)
- Neural Network Models of Cognition: PSYCH 209 (Win)
- Research Seminar: Mind, Brain, and Computation: PSYCH 373 (Aut, Win, Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Michael Lingelbach, Joshua Ryu

Doctoral Dissertation Advisor (AC)

Effie Li, Andrew Nam

Doctoral (Program)

Satchel Grant, Jerome Han, Violet Xiang

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **The dynamics of multimodal integration: The averaging diffusion model.** *Psychonomic bulletin & review*
Turner, B. M., Gao, J., Koenig, S., Palfy, D., L McClelland, J.
2017

- **What Learning Systems do Intelligent Agents Need? Complementary Learning Systems Theory Updated** *TRENDS IN COGNITIVE SCIENCES*
Kumaran, D., Hassabis, D., McClelland, J. L.
2016; 20 (7): 512-534
- **Bayesian analysis of simulation-based models** *JOURNAL OF MATHEMATICAL PSYCHOLOGY*
Turner, B. M., Sederberg, P. B., McClelland, J. L.
2016; 72: 191-199
- **You shall know an object by the company it keeps: An investigation of semantic representations derived from object co-occurrence in visual scenes.** *Neuropsychologia*
Sadeghi, Z., McClelland, J. L., Hoffman, P.
2015; 76: 52-61
- **Payoff Information Biases a Fast Guess Process in Perceptual Decision Making under Deadline Pressure: Evidence from Behavior, Evoked Potentials, and Quantitative Model Comparison.** *journal of neuroscience*
Noorbaloochi, S., Sharon, D., McClelland, J. L.
2015; 35 (31): 10989-11011
- **Connectionist perspectives on language learning, representation and processing** *WILEY INTERDISCIPLINARY REVIEWS-COGNITIVE SCIENCE*
Joanisse, M. F., McClelland, J. L.
2015; 6 (3): 235-247
- **Connectionist perspectives on language learning, representation and processing.** *Wiley interdisciplinary reviews. Cognitive science*
Joanisse, M. F., McClelland, J. L.
2015; 6 (3): 235-247
- **Parallel Distributed Processing at 25: Further Explorations in the Microstructure of Cognition** *COGNITIVE SCIENCE*
Rogers, T. T., McClelland, J. L.
2014; 38 (6): 1024-1077
- **Interactive activation and mutual constraint satisfaction in perception and cognition.** *Cognitive science*
McClelland, J. L., Mirman, D., Bolger, D. J., Khaitan, P.
2014; 38 (6): 1139-1189
- **Why bilateral damage is worse than unilateral damage to the brain.** *Journal of cognitive neuroscience*
Schapiro, A. C., McClelland, J. L., Welbourne, S. R., Rogers, T. T., Lambon Ralph, M. A.
2013; 25 (12): 2107-2123
- **Context, cortex, and associations: a connectionist developmental approach to verbal analogies** *FRONTIERS IN PSYCHOLOGY*
Kollias, P., McClelland, J. L.
2013; 4
- **Incorporating rapid neocortical learning of new schema-consistent information into complementary learning systems theory.** *Journal of experimental psychology. General*
McClelland, J. L.
2013; 142 (4): 1190-1210
- **A Differentiation Account of Recognition Memory: Evidence from fMRI** *JOURNAL OF COGNITIVE NEUROSCIENCE*
Criss, A. H., Wheeler, M. E., McClelland, J. L.
2013; 25 (3): 421-435
- **Integrating probabilistic models of perception and interactive neural networks: a historical and tutorial review.** *Frontiers in psychology*
McClelland, J. L.
2013; 4: 503-?
- **Retrospective. R. Duncan Luce (1925-2012).** *Science*
McClelland, J. L.
2012; 337 (6102): 1619-?
- **Generalization Through the Recurrent Interaction of Episodic Memories: A Model of the Hippocampal System** *PSYCHOLOGICAL REVIEW*

-
- Kumaran, D., McClelland, J. L.
2012; 119 (3): 573-616
- **Can native Japanese listeners learn to differentiate /r-l/ on the basis of F3 onset frequency?** *BILINGUALISM-LANGUAGE AND COGNITION*
Ingvalson, E. M., Holt, L. L., McClelland, J. L.
2012; 15 (2): 255-274
 - **Two Mechanisms of Human Contingency Learning** *PSYCHOLOGICAL SCIENCE*
Sternberg, D. A., McClelland, J. L.
2012; 23 (1): 59-68
 - **Using time-varying evidence to test models of decision dynamics: bounded diffusion vs. the leaky competing accumulator model** *FRONTIERS IN NEUROSCIENCE*
Tsetsos, K., Gao, J., McClelland, J. L., Usher, M.
2012; 6
 - **Predicting native English-like performance by native Japanese speakers** *JOURNAL OF PHONETICS*
Ingvalson, E. M., McClelland, J. L., Holt, L. L.
2011; 39 (4): 571-584
 - **Dynamic Integration of Reward and Stimulus Information in Perceptual Decision-Making** *PLOS ONE*
Gao, J., Tortell, R., McClelland, J. L.
2011; 6 (3)
 - **A PDP model of the simultaneous perception of multiple objects** *CONNECTION SCIENCE*
Henderson, C. M., McClelland, J. L.
2011; 23 (2): 161-172
 - **Testing multi-alternative decision models with non-stationary evidence** *FRONTIERS IN NEUROSCIENCE*
Tsetsos, K., Usher, M., McClelland, J. L.
2011; 5
 - **Are there mental lexicons? The role of semantics in lexical decision** *BRAIN RESEARCH*
Dilkina, K., McClelland, J. L., Plaut, D. C.
2010; 1365: 66-81
 - **Emergence in Cognitive Science** *TOPICS IN COGNITIVE SCIENCE*
McClelland, J. L.
2010; 2 (4): 751-770
 - **Letting structure emerge: connectionist and dynamical systems approaches to cognition** *TRENDS IN COGNITIVE SCIENCES*
McClelland, J. L., Botvinick, M. M., Noelle, D. C., Plaut, D. C., Rogers, T. T., Seidenberg, M. S., Smith, L. B.
2010; 14 (8): 348-356
 - **Integration of Sensory and Reward Information during Perceptual Decision-Making in Lateral Intraparietal Cortex (LIP) of the Macaque Monkey** *PLOS ONE*
Rorie, A. E., Gao, J., McClelland, J. L., Newsome, W. T.
2010; 5 (2)
 - **Modeling Unsupervised Perceptual Category Learning** *IEEE TRANSACTIONS ON AUTONOMOUS MENTAL DEVELOPMENT*
Lake, B. M., Vallabha, G. K., McClelland, J. L.
2009; 1 (1): 35-43
 - **A connectionist model of a continuous developmental transition in the balance scale task** *COGNITION*
Schapiro, A. C., McClelland, J. L.
2009; 110 (3): 395-411
 - **Is a Machine Realization of Truly Human-Like Intelligence Achievable?** *COGNITIVE COMPUTATION*
McClelland, J. L.
2009; 1 (1): 17-21

- **The Place of Modeling in Cognitive Science** *TOPICS IN COGNITIVE SCIENCE*
McClelland, J. L.
2009; 1 (1): 11-38
- **Precis of Semantic Cognition: A Parallel Distributed Processing Approach** *BEHAVIORAL AND BRAIN SCIENCES*
Rogers, T. T., McClelland, J. L.
2008; 31 (6): 689-?
- **Objective assessment of deformable image registration in radiotherapy: A multi-institution study** *MEDICAL PHYSICS*
Kashani, R., Hub, M., Balter, J. M., Kessler, M. L., Dong, L., Zhang, L., Xing, L., Xie, Y., Hawkes, D., Schnabel, J. A., McClelland, J., Joshi, S., Chen, et al
2008; 35 (12): 5944-5953
- **Effects of attention on the strength of lexical influences on speech perception: Behavioral experiments and computational mechanisms** *COGNITIVE SCIENCE*
Mirman, D., McClelland, J. L., Holt, L. L., Magnuson, J. S.
2008; 32 (2): 398-417
- **Modeling Unsupervised Perceptual Category Learning** *7th IEEE International Conference on Development and Learning*
Lake, B. M., Vallabha, G. K., McClelland, J. L.
IEEE.2008: 25-30
- **A single-system account of semantic and lexical deficits in five semantic dementia patients** *COGNITIVE NEUROPSYCHOLOGY*
Dilkina, K., McClelland, J. L., Plaut, D. C.
2008; 25 (2): 136-164
- **Language is not just for talking - Redundant labels facilitate learning of novel categories** *PSYCHOLOGICAL SCIENCE*
Lupyan, G., Rakison, D. H., McClelland, J. L.
2007; 18 (12): 1077-1083
- **Unsupervised learning of vowel categories from infant-directed speech** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Vallabha, G. K., McClelland, J. L., Pons, F., Werker, J. F., Amano, S.
2007; 104 (33): 13273-13278
- **Using domain-general principles to explain children's causal reasoning abilities** *DEVELOPMENTAL SCIENCE*
McClelland, J. L., Thompson, R. M.
2007; 10 (3): 333-356
- **Success and failure of new speech category learning in adulthood: Consequences of learned Hebbian attractors in topographic maps** *COGNITIVE AFFECTIVE & BEHAVIORAL NEUROSCIENCE*
Vallabha, G. K., McClelland, J. L.
2007; 7 (1): 53-73
- **Gradiance of gradiance: A reply to Jackendoff (Ray Jackendoff)** *LINGUISTIC REVIEW*
McClelland, J. L., Bybee, J.
2007; 24 (4): 437-455
- **A homeostatic rule for inhibitory synapses promotes temporal sharpening and cortical reorganization** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Moldakarimov, S. B., McClelland, J. L., Ermentrout, G. B.
2006; 103 (44): 16526-16531
- **ON THE CONTROL OF AUTOMATIC PROCESSES - A PARALLEL DISTRIBUTED-PROCESSING ACCOUNT OF THE STROOP EFFECT** *PSYCHOLOGICAL REVIEW*
Cohen, J. D., Dunbar, K., McClelland, J. L.
1990; 97 (3): 332-361
- **A SIMULATION-BASED TUTORIAL SYSTEM FOR EXPLORING PARALLEL DISTRIBUTED-PROCESSING** *BEHAVIOR RESEARCH METHODS INSTRUMENTS & COMPUTERS*
McClelland, J. L., Rumelhart, D. E.

