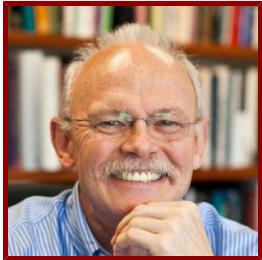


# Stanford

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## 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](mailto:rittler@stanford.edu)

**Tel** 6507237431

### Bio

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### 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

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### 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

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### 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

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### 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*  
McCllelland, J. L.  
2009; 1 (1): 11-38
- **Precis of Semantic Cognition: A Parallel Distributed Processing Approach** *BEHAVIORAL AND BRAIN SCIENCES*  
Rogers, T. T., McCllelland, 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., McCllelland, 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., McCllelland, 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., McCllelland, J. L.  
IEEE.2008: 25–30
- **A single-system account of semantic and lexical deficits in five semantic dementia patients** *COGNITIVE NEUROPSYCHOLOGY*  
Dilkina, K., McCllelland, 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., McCllelland, 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., McCllelland, 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*  
McCllelland, 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., McCllelland, J. L.  
2007; 7 (1): 53-73
- **Gradience of gradience: A reply to Jackendoff (Ray Jackendoff)** *LINGUISTIC REVIEW*  
McCllelland, 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., McCllelland, 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., McCllelland, J. L.  
1990; 97 (3): 332-361
- **A SIMULATION-BASED TUTORIAL SYSTEM FOR EXPLORING PARALLEL DISTRIBUTED-PROCESSING** *BEHAVIOR RESEARCH METHODS INSTRUMENTS & COMPUTERS*  
McCllelland, J. L., Rumelhart, D. E.

