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### Research Profile of

### James L. (Jay) McClelland

R. Sambasiva Rao,  
School of Chemistry,  
Andhra University,  
Visakhapatnam 530 003, India

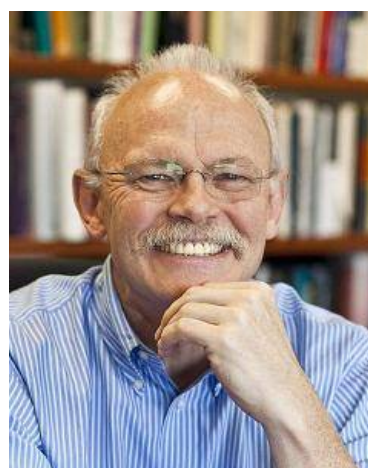
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Rumelhart Prize  
of 2010



for Science and Engineering  
Stanford, California, United States

Awarded to  
James Lloyd "Jay" McClelland



Lucie Stern Professor in the Social Sciences  
 Director, Center for Mind, Brain & Computation  
 Dept of Psychology, Stanford Univ.  
 Stanford, CA  
[mccllland@stanford.edu](mailto:mccllland@stanford.edu)

McClelland Born on December 1, 1948;  
 at  
 Cambridge, Massachusetts., US

<b># publications : 600+ (1979 to 2021)</b>		
	<b>All</b>	<b>Since 2015</b>
Citations/Quotes	1,12,462	23, 272
h-index	112	60
Accessed on		16-05-2021

**Academic profile of James McClelland**

B.A. in Psychology	Columbia University	1970
Ph.D. in Cognitive Psychology (#)	University of Pennsylvania	1975

(#) Title of Ph.D. thesis: Preliminary letter identification in the perception of words and nonwords




**Employment. James McClelland**

Assistant Professor	Dept. of Psychology	UCSD	1974-1980
Associate Professor	Dept. of Psychology	UCSD	1980-1984
Visiting Scientist	Psychology and Cognitive Science	MIT	1982-1984
Visiting Scholar	Dept. of Psychology	Harvard Univ.	1982-1984
Associate Professor	Dept. of Psychology	Carnegie-Mellon Univ.	1984-1985
Professor	Dept. of Psychology	Carnegie Mellon Univ.	1985-2006
Joint Appointment in Computer Science	Carnegie Mellon Univ.		1987-2006
Acting Head	Dept. of Psychology	Carnegie Mellon Univ.	1989-90
Co-Director	Center for the Neural Basis of Cognition	Carnegie Mellon Univ.	1994-2006
Adjunct Professor	Dept. of Neuroscience	Univ. of Pittsburgh	1995-2006
Joint Appointment in Biological Sciences	Carnegie Mellon		2000-2006
Professor	Carnegie Mellon		2001-2006
Walter Van Dyke Bingham Professorship	in Psychology and Cognitive Neuroscience		2002
Professor	Dept. of Psychology	Stanford Univ.	2006-
Founder and Director	Center for Mind Brain and		2006-2018



	Computation Stanford Universirty		
Adjunct Professor	University of Manchester Manchester UK		2007-
Chair	Dept. of Psychology	Stanford Univ.	2009-2012
Lucie Stern Professor in the Social Sciences	Stanford University		2009-
Teaching	Stanford	Symbolic Systems Program at	
Teaching	Psychology Department	PDP approach to cognition and its neural basis	
Research	Stanford	Learning, memory, conceptual development, langauge processing, mathematical cognition	
Consulting research scientist	DeepMind		

### Expertise of James McClelland

#### Models

-  Connectionist
-  Parallel distributed  
processing
-  Statistical learning

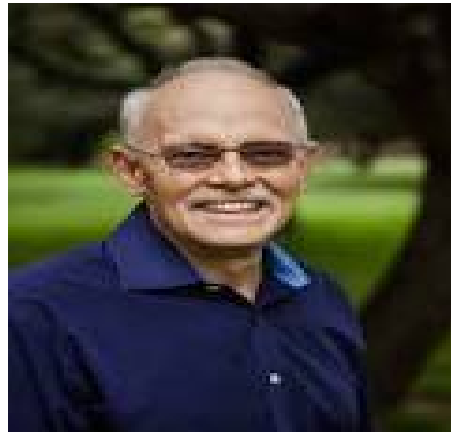
#### Connectionist models Applications

-  Psycholinguistics
  - Language learning
  - Memory processes
  - Neurobiology of memory
-  Cognitive phenomena: cognitive development
  - Word recognition
    - Spoken and visual
  - Perception
  - Learning

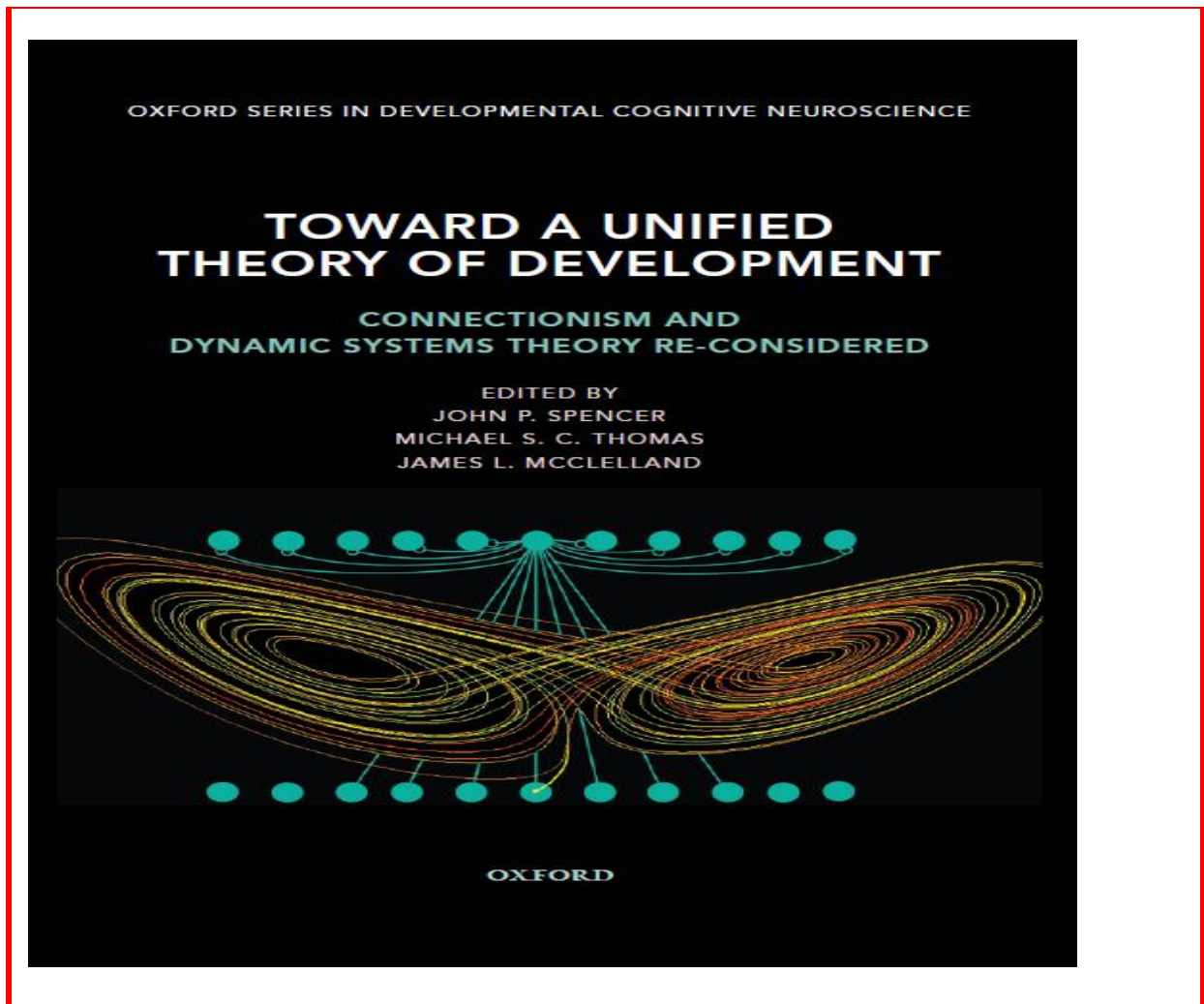
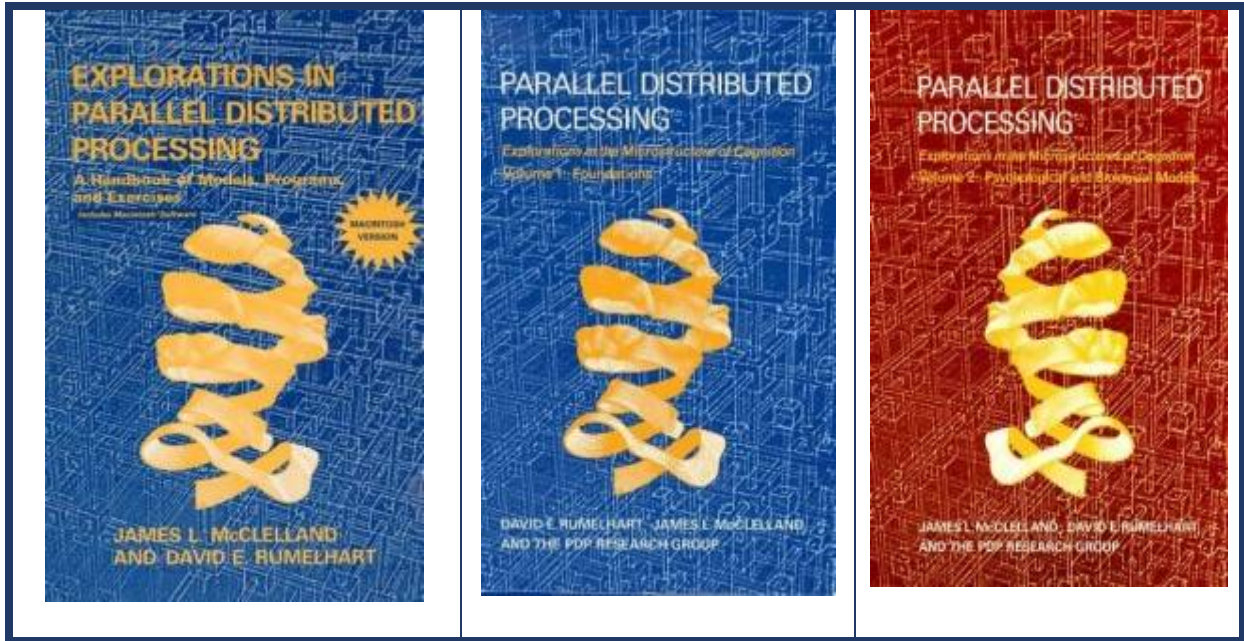
### Books of James McClelland

Year	Title	Authors
2010	The Memory Process, Neuroscientific and Humanistic Perspectives	Suzanne Nalbantian Paul M. Matthews <b>James L. McClelland</b>
2004	Semantic Cognition A Parallel Distributed Processing Approach	Timothy T. Rogers <b>James L. McClelland</b>
1996	Attention and Performance XVI Information Integration in Perception and Communication	Inui Toshio <b>James L. McClelland</b>
1989	Explorations in Parallel Distributed Processing - Macintosh version A Handbook of Models, Programs, and Exercises	<b>James L. McClelland</b> David E. Rumelhart
1988	Explorations in Parallel Distributed Processing - IBM version Includes two 5 1/4" DS/DD diskettes for IBM PCs and compatibles	<b>James L. McClelland</b> David E. Rumelhart

1986	Parallel Distributed Processing, Volume 1 Explorations in the Microstructure of Cognition: Foundations	David E. Rumelhart <b>James L. McClelland</b> PDP Research Group
1986	Parallel Distributed Processing, Volume 2 Explorations in the Microstructure of Cognition: Psychological and Biological Models	<b>James L. McClelland</b> David E. Rumelhart PDP Research Group



2010	2004	1996
1989	1986	1986





Thomas, M. S. C., McClelland, J. L., Richardson, F. M., Schapiro, A. C. & Baughman, F. (2009). Dynamical and Connectionist Approaches to Development: Toward a Future of Mutually Beneficial Co-evolution. In J.P. Spencer, M. S. C. Thomas, & J. L. McClelland, (Eds). *Toward a unified theory of development: Connectionism and dynamic systems theory re-considered*. pp 337-353. New York: Oxford. [PDF]

Spencer, J. P., Thomas, M. S. C., & McClelland, J. L. (2009). *Toward a unified theory of development: Connectionism and dynamic systems theory re-considered*. New York: Oxford. [Book Cover PDF]

Awards to James McClelland	
2014	o C.L. de Carvalho-Heineken Prize
2002	o University of Louisville Grawemeyer Award in psychology
2002	o IEEE Neural Networks Pioneer Award
2001	o Grawemeyer Prize in Psychology
1993	o Howard Crosby Warren Medal from the Society of Experimental Psychologist o McClelland and Rumelhart jointly received
1981—86 1987—97	o Research Scientist Career Development Award from o National Institute of Mental Health
1970—73	o Fellow National Science Foundation
1970	o William W. Cumming prize from Columbia University
United Kingdom's national academy for the humanities and social science	
2017	o Elected as a Corresponding Fellow of the British Academy (FBA)

### Biological Family of James McClelland

Father	Walter Moore
Mother	Frances (Shaffer) McClelland

Wife	Heidi Marsha Feldman	Marriage on May 6, 1978
Children	Two daughters	

## Research papers of McClelland J L

Deep Neural networks	Publications	McClelland
<p>Hoffman, P., McClelland, J. L., &amp; Lambon Ralph, M. A., (2018). Concepts, control, and context: A connectionist account of normal and disordered semantic cognition. <i>Psychological Review</i>. 125(3), 293-328. [PDF]</p>		
<p>Testolin, A., Zou, W. Y., &amp; McClelland, J. L. (2020). Numerosity discrimination in deep neural networks: Initial competence, developmental refinement and experience statistics. <i>Developmental Science</i>, e12940. doi: <a href="https://doi.org/10.1111/desc.12940">10.1111/desc.12940</a>. [PDF]</p>		
<p>McClelland, J. L. (). Exemplar models are useful and deep neural networks overcome their limitations: A commentary on Ambridge (2020). <i>First Language</i>. doi: <a href="https://doi.org/10.1177/0142723720905765">10.1177/0142723720905765</a>. [PDF]</p>		
<p>Saxe, A. M., McClelland, J. L., &amp; Ganguli, S. (2019). A mathematical theory of semantic development in deep neural networks. <i>Proceedings of the National Academy of Sciences, USA</i>. 116(23), 11537-11546. <a href="https://doi.org/10.1073/pnas.182022611">pnas.182022611</a>. [PDF] [<a href="#">Supplementary Information PDF</a>]</p>		
<p>Saxe, A. M., McClelland, J. L., &amp; Ganguli, S. (2013). Learning hierarchical category structure in deep neural networks. In M. Knauff, M. Paulen, N. Sebanz, &amp; I. Wachsmuth (Eds.), <i>Proceedings of the 35th annual meeting of the Cognitive Science Society</i>. (pp. 1271-1276). Austin, TX: Cognitive Science Society. [PDF]</p>		
<p>Testolin, A., Zou, W. Y., &amp; McClelland, J. L. (2020). Numerosity discrimination in deep neural networks: Initial competence, developmental refinement and experience statistics. <i>Developmental Science</i>, e12940. doi: <a href="https://doi.org/10.1111/desc.12940">10.1111/desc.12940</a>. [PDF]</p>		
<p>McClelland, J. L. (). Exemplar models are useful and deep neural networks overcome their limitations: A commentary on Ambridge (2020). <i>First Language</i>. doi: <a href="https://doi.org/10.1177/0142723720905765">10.1177/0142723720905765</a>. [PDF]</p>		
<p>Saxe, A. M., McClelland, J. L., &amp; Ganguli, S. (2019). A mathematical theory of semantic development in deep neural networks. <i>Proceedings of the National Academy of Sciences, USA</i>. 116(23), 11537-11546. <a href="https://doi.org/10.1073/pnas.182022611">pnas.182022611</a>. [PDF] [<a href="#">Supplementary Information PDF</a>]</p>		
<p>Saxe, A. M., McClelland, J. L., &amp; Ganguli, S. (2013). Learning hierarchical category structure in deep neural networks. In M. Knauff, M. Paulen, N. Sebanz, &amp; I. Wachsmuth (Eds.), <i>Proceedings of the 35th annual meeting of the Cognitive Science Society</i>. (pp. 1271-1276). Austin, TX: Cognitive Science Society. [PDF]</p>		

Neural networks	Publications	McClelland
<p>Sabathiel, S., McClelland, J. L. &amp; Solstad, T. (2020). Emerging Representations for Counting in a Neural Network Agent Interacting with a Multimodal Environment. In Bongard, J., Lovato, J., Herbert-Dufresne, L., Dasari, R. &amp; Soros, L. <i>Proceedings of the 2020 Conference on Artificial Life</i>. (pp. 736-743). Cambridge, MA. MIT Press. <a href="#">[PDF]</a></p>		
<p>Chen, S., Zhou, Z., Fang, M., &amp; McClelland, J. L. (2018). Can <b>generic</b> neural networks estimate numerosity like humans? In T.T. Rogers, M. Rau, X. Zhu, &amp; C. W. Kalish (Eds.), <i>Proceedings of the 40th Annual Conference of the Cognitive Science Society</i>, 202-207. Austin, TX: Cognitive Science Society. <a href="#">[PDF]</a></p>		
<p>Fang, M., Zhou, Z., Chen, S., &amp; McClelland, J. L. (2018). Can a <b>recurrent</b> neural network learn to count things? In T.T. Rogers, M. Rau, X. Zhu, &amp; C. W. Kalish (Eds.), <i>Proceedings of the 40th Annual Conference of the Cognitive Science Society</i>, 360-365. Austin, TX: Cognitive Science Society. <a href="#">[PDF]</a></p>		
<p>Servan-Schreiber, D., Cleeremans, A. &amp; McClelland, J. L. (1991). Graded state machines: The representation of temporal contingencies in simple <b>recurrent networks</b>. <i>Machine Learning</i>, 7, 161-193. <a href="#">[PDF]</a></p>		
<p>Lampinen, A., Hsu, S., &amp; McClelland, J. L. (2017). Analogies emerge from learning dynamics in neural networks. In G. Gunzelmann, A. Howes, T. Tenbrink, &amp; E. J. Davelaar (Eds.), <i>Proceedings of the 39th Annual Conference of the Cognitive Science Society</i>, pp. 2512-2517, Austin, TX: Cognitive Science Society. <a href="#">[PDF]</a></p>		
<p>Mickey, K. W., &amp; McClelland, J. L. (2014). A neural network model of learning mathematical equivalence. <i>Proceedings of the 36th Annual Meeting of the Cognitive Science Society</i>, pp 1012-1017. Cognitive Science Society: Austin, TX. <a href="#">[PDF]</a>.</p>		
<p>McClelland, J. L. (2013). Integrating probabilistic models of perception and interactive neural networks: A historical and tutorial review. <i>Frontiers in Psychology</i>, 4, 503. <a href="#">[PDF]</a>. <a href="https://doi.org/10.3389/fpsyg.2013.00503">[DOI: 10.3389/fpsyg.2013.00503]</a>.</p>		
<p>McClelland, J. L. &amp; Plunkett, K. (1995). Cognitive development. In Michael A. Arbib (Ed.), <i>The Handbook of Brain Theory and Neural Networks</i>. Cambridge, MA: MIT Press, pp 193-197. <a href="#">[PDF]</a></p>		
<p>McClelland, J. L. (1994). Comment: Neural networks and cognitive science: Motivations and applications. (Cheng, B. &amp; Titterton, D. M. Neural Networks: A review from a statistical perspective.) <i>Statistical Science</i>, 9, 1, 2-54. <a href="#">[PDF]</a></p>		
<p>Farah, M. J. McClelland, J. L. (1992). Neural network models and cognitive neuropsychology. <i>Psychiatric Annals</i>, 22, 148-153. <a href="#">[PDF]</a></p>		

Consciousness	Publications	McClelland
<p>McClelland, J. L. (1997). The neural basis of consciousness and explicit memory: Reflections on Kihlstrom, Mandler, &amp; Rumelhart. In J. D. Cohen &amp; J. W. Schooler (Eds.) <i>Scientific approaches to consciousness</i>. Mahwah, NJ: Erlbaum, 499-509. <a href="#">[PDF]</a></p>		



Mind	Publications	McClelland
<p>McClelland, J. L. (1992). Can connectionist models discover the structure of natural language? In Morelli, R., Brown, W. M., Anselmi, D., Haberlandt, K., Lloyd, D. (Eds.) <i>Minds, Brains &amp; Computers</i>, pp. 168-189. Ablex Publishing: Norwood, NJ. <a href="#">[PDF]</a></p>		
<p>Flusberg, S. J. &amp; McClelland, J. L. (2014). Connectionism and the emergence of mind. S. Chipman (Ed.), <i>The Oxford Handbook of Cognitive Science</i>. Forthcoming: published on-line, Nov 2014. <a href="#">[PDF]</a></p>		
<p>McClelland, J. L. (2013). Cognitive neuroscience: Emergence of mind from brain. An introduction to the cognitive neuroscience series. In McClelland, J. L. and Lambon Ralph, M. A. (eds), <i>Cognitive Neuroscience: Emergence of mind from brain</i>, The Biomedical &amp; Life Sciences Collection, <a href="#">Henry Stewart Talks Ltd</a>, London. <a href="#">[Link to Talk]</a></p>		
<p>Usher, M., Elhalal, A. &amp; McClelland, J. L. (2008). The neurodynamics of choice, value-based decisions, and preference reversal. In Chater, N. &amp; Oaksford, M. <i>The Probabilistic Mind</i>. New York: Oxford University Press. 278-300. <a href="#">[PDF]</a></p>		
<p>McClelland, J. L. (1998). Complementary learning systems in the brain: A connectionist approach to explicit and implicit cognition and memory. In R. M. Bilder &amp; F. F. LeFevre (Eds.) <i>Neuroscience of the Mind on the Centennial of Freud's Project for a Scientific Psychology. Annals of the New York Academy of Sciences</i>, 843, 153-169. <a href="#">[PDF]</a></p>		
Brain	Publications	McClelland
<p>Schapiro, A. C., McClelland, J. L., Welbourne, S. R., Rogers, T. T., &amp; Lambon Ralph, M. A. (2013). Why bilateral damage is worse than unilateral damage to the brain. <i>Journal of Cognitive Neuroscience</i>, 25(12), 2107-2123. doi:10.1162/jocn_a_00441. <a href="#">[PDF]</a></p>		
<p>Dilkina, K., McClelland, J. L. &amp; Plaut, D. C. (2010). Are there mental lexicons? The role of semantics in lexical decision. <i>Brain Research</i>, 1365, 66-81. <a href="#">[PDF]</a> <a href="#">[DOI]</a></p>		
<p>Plaut, D. C., &amp; McClelland, J. L. (2010). Locating object knowledge in the brain: A critique of Bowers' (2009) attempt to revive the grandmother cell hypothesis. <i>Psychological Review</i>, 117, 284-288. <a href="#">[PDF]</a> <a href="#">[DOI]</a></p>		
<p>Mechelli, A., Josephs, O., Lambon Ralph, M. A., McClelland, J. L., &amp; Price, C. J. (2007). Dissociating stimulus-driven semantic and phonological effects during reading and naming. <i>Human Brain Mapping</i>, 28, 205-217. <a href="#">[PDF]</a></p>		
<p>McClelland, J. L. &amp; Lupyan, G. (2002). Double dissociations never license simple inferences about underlying brain organization, especially in developmental cases. Commentary on a target article by Thomas &amp; Karmiloff-Smith. <i>Behavioral &amp; Brain Sciences</i>, 25, 763-764. <a href="#">[HTML.]</a> <a href="#">[Target Article PDF with Commentaries.]</a></p>		

Learning	Publications	McClelland
<p>McClelland, J. L., McNaughton, B. L., &amp; Lampinen, A. (2020). Integration of new information in memory: New insights from a complementary learning systems perspective. <i>Philosophical Transactions of the Royal Society B.</i>, 375: 20190637. <a href="http://dx.doi.org/10.1098/rstb.2019.0637">http://dx.doi.org/10.1098/rstb.2019.0637</a>. <a href="#">[PDF]</a> <a href="#">[Supplement PDF]</a></p>		

Sabathiel, S., McClelland, J. L. & Solstad, T. (2020). A computational model of learning to count in a multimodal, interactive environment. In S. Denison., M. Mack, Y. Xu, & B.C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp.1425-1431). Cognitive Science Society. [\[PDF\]](#)

Singh, A. & McClelland, J. L. (2020). Human-like learning environment for frequency-skewed multi-level classification. In S. Denison., M. Mack, Y. Xu, & B.C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp 2165-2171). Cognitive Science Society. [\[PDF\]](#)

Rostami, M., Kolouri, S., McClelland, J., & Pilly, P. (2019). Generative Continual Concept Learning. [arXiv:1906.03744](#)

Lampinen, A. K. & McClelland, J. L. (2018). Different presentations of a mathematical concept can support learning in complementary ways. *Journal of Educational Psychology*, *110*(5), 664-682. [\[PDF\]](#)

Kumaran, D., Hassabis, D., & McClelland, J. L. (2016). What learning systems do intelligent agents need? Complementary learning systems theory updated. *Trends in Cognitive Sciences*, *20*, 512-534. DOI: 10.1016/j.tics.2016.05.004. [\[PDF\]](#)

Joanisse, M. F., & McClelland, J. L. (2015). Connectionist perspectives on language learning, representation, and processing. *WIREs Cognitive Science*. doi: 10.1002/wcs.1340 [\[PDF\]](#)

McClelland, J. L. (2014). Learning to discriminate English /r/ and /l/ in adulthood: Behavioral and modeling studies. *Studies in Language Sciences: Journal of the Japanese Society for Language Sciences*, *13*, 32-52. Tokyo: Kaitakusha. [\[PDF\]](#)

McClelland, J. L. (2013). Incorporating rapid neocortical learning of new schema-consistent information into complementary learning systems theory. *Journal of Experimental Psychology: General*, *142*(4), 1190-1210. doi: 10.1037/a0033812. [\[PDF\]](#)

Sternberg, D. A. & McClelland, J. L. (2012). Two mechanisms of human contingency learning. *Psychological Science*, *23*(1), 59-68. [\[PDF\]](#) [\[DOI\]](#).

Lake, B. M., Vallabha, G. K. & McClelland, J. L. (2009). Modeling unsupervised perceptual category learning. *IEEE Transactions on Autonomous Mental Development*, *1*, 35-43. [\[PDF\]](#)

Sternberg, D., & McClelland, J. L. (2009). When Should We Expect Indirect Effects in Human Contingency Learning? In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 206-211). Austin, TX: Cognitive Science Society. [\[PDF\]](#)

Lupyan, G., Rakison, D. H. & McClelland, J. L. (2007). Language is not just for talking: redundant labels facilitate learning of novel categories. *Psychological Science*, *18*(12), 1077-1083. [\[PDF\]](#)

Vallabha, G. K. & McClelland, J. L. (2007). Success and failure of new speech category learning in adulthood: Consequences of learned Hebbian attractors in topographic maps. *Cognitive, Affective and Behavioral Neuroscience*, *7*, 53-73. [\[PDF\]](#)

Vallabha, G. K., McClelland, J. L., Pons, F., Werker, J. & Amano, S. (2007). Unsupervised learning of vowel categories from infant-directed speech. *Proceedings of the National Academy of Science*, 104, 13273-13278. [[PDF](#)] [[Supplementary Info. PDF](#)]

McClelland, J. L. (2006). How far can you go with **Hebbian learning**, and when does it lead you astray? In Munakata, Y. & Johnson, M. H. *Processes of Change in Brain and Cognitive Development: Attention and Performance XXI*. pp. 33-69. Oxford: Oxford University Press. [[PDF](#)]

Tricomi, E., Delgado, M. R., McCandliss, B. D., McClelland, J. L. & Fiez, J. A. (2006). Performance feedback drives caudate activation in a phonological learning task. *Journal of Cognitive Neuroscience*, 18, 1029-1043. [[PDF](#)]

McClelland, J. L., & Plaut, D. C. (1999). Does generalization in infant learning implicate abstract algebra-like rules? [[PDF](#)]

McClelland, J., Thomas, A., McCandliss, B., & Fiez, J. (1999). Understanding Failures of Learning: Hebbian Learning, Competition for Representational Space, and Some Preliminary Experimental Data. In J. Reggia, E. Ruppin & D. Glanzman (Eds.), *Progress in Brain Research. Volume 121. Disorders of Brain, Behavior and Cognition: The Neurocomputational Perspective*, Amsterdam: Elsevier, 75-80. [[PDF](#)]

McClelland, J. L. (1998). Role of the hippocampus in learning and memory: A computational analysis. In K. H. Pribram (Ed.) *Brain and Values: Is a Biological Science of Values Possible*. Mahwah, NJ: Erlbaum, 535-547. [[PDF](#)]

McClelland, J. L. (1996). Role of the hippocampus in learning and memory: A computational analysis. In T. Ono, B. L. McNaughton, S. Molitchnikoff, E. T. Rolls & H. Nichijo (Eds.), *Perception Memory, and Emotion: Frontier in Neuroscience*. Oxford: Elsevier Science, Ltd. 601-613. [[PDF](#)]

McClelland, J. L. & Goddard, N. (1996). Considerations arising from a complementary learning systems perspective on hippocampus and neocortex. *Hippocampus*, 6, 654-665. [[PDF](#)]

McClelland, J. L., McNaughton, B. L., & O'Reilly, R. C. (1995). Why there are complementary learning systems in the hippocampus and neocortex: Insights from the successes and failures of connectionist models of learning and memory. *Psychological Review*, 102, 419-457. [[PDF](#)] An interview with the authors of this highly cited paper is available [[here](#)].

McClelland, J. L. (1994). Learning the general but not the specific. *Current Biology*, 4, 357-358. [[PDF](#)]

Movellan, J. R. & McClelland, J. L. (1994). Contrastive learning with graded random networks. In T. Petsche & M. Kearns (Eds.), *Computational Learning Theory and Natural Learning Systems, Vol. 2*. MIT Press: Cambridge, MA.

Stark, C. E. & McClelland, J. L. (1994). Tractable learning of probability distributions using the contrastive Hebbian algorithm. In *Proceedings of the 16th Annual Meeting of the Cognitive Science Society*. Hillsdale, NJ: Erlbaum, 818-823. [[PDF](#)].

Learning	Publications	McClelland
Movellan, J. R. & McClelland, J. L. (1993). Learning continuous probability distributions with symmetric diffusion networks. <i>Cognitive Science</i> , 17, 463-496. <a href="#">[PDF]</a>		
Cleeremans, A. & McClelland, J. L. (1991). Learning the structure of event sequences. <i>Journal of Experimental Psychology: General</i> , 120,, 235-253. <a href="#">[PDF]</a>		
St. John, M. F., & McClelland, J. L. (1990). Learning and applying contextual constraints in sentence comprehension. <i>Artificial Intelligence</i> , 46, 217-257. <a href="#">[PDF]</a>		
Hinton, G. E., & McClelland, J. L. (1988). Learning representations by recirculation. In D. Z. Anderson, (Ed.), <i>Neural information processing systems</i> (pp. 358-366). New York: American Institute of Physics. <a href="#">[PDF]</a>		
Rumelhart, D. E. & McClelland, J. L. (1987). Learning the past tenses of english verbs: Implicit rules or parallel distributed processing. In B. MacWhinney (Ed.), <i>Mechanisms of Language Acquisition</i> (pp. 194-248). Mahwah, NJ: Erlbaum.		

Memory	Publications	McClelland
McClelland, J. L. (2010). <b>Memory</b> and its neural basis. In McClelland, J. L. and Lambon Ralph, M. A. (Eds), <i>Cognitive Neuroscience: Emergence of mind from brain</i> , The Biomedical & Life Sciences Collection, <a href="#">Henry Stewart Talks Ltd</a> , London. <a href="#">[Link to Talk]</a>		
McClelland, J. L. (2011). Memory as a constructive process: The parallel-distributed processing approach. In S. Nalbantian, P. Matthews, and J. L. McClelland (Eds.), <i>The Memory Process: Neuroscientific and Humanistic Perspectives</i> . Cambridge, MA: MIT Press, pp. 129-151. <a href="#">[PDF]</a>		
Criss, A. & McClelland, J. L. (2006). Differentiating the differentiation models: A comparison of the retrieving effectively from memory model (REM) and the subjective likelihood model (SLiM). <i>Journal of Memory and Language</i> , 55, 447-460. <a href="#">[PDF]</a>		
Lambon Ralph, M. A., McClelland, J. L., Patterson, K., & Hodges, J. R. (2000). The relationship between semantic memory and speech production: Neuropsychology, neuroanatomy, and neural-net model. <i>Higher Brain Function Research (ShitsugoshoKenkyu)</i> , 20, 145-156.		
McClelland, J. L. (1995). Constructive memory and memory distortions: A parallel-distributed processing approach. In D. L. Schacter, (Ed.), <i>Memory Distortion</i> . Cambridge, MA: Harvard, 69-90. <a href="#">[PDF]</a>		
Farah, M. J., & McClelland, J. L. (1991). A computational model of semantic memory impairment: Modality- specificity and emergent category-specificity. <i>Journal of Experimental Psychology: General</i> , 120, 339-357. <a href="#">[PDF]</a>		
McClelland, J. L. & Rumelhart, D. E. Distributed memory and amnesia. Vol II, Ch 25. <a href="#">[PDF]</a>		
McClelland, J. L. (1985). Distributed models of cognitive processes. In D. Olton, E. Gamzu, & S. Corkin (Eds.), <i>Memory Dysfunctions: An integration of animal and human</i>		

Memory	Publications	McClelland
<i>research</i> . New York: New York Academy of Sciences. <a href="#">[PDF]</a>		
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**Note:** The article above introduces a special issue of [Cognitive Science \(Volume 38, Issue 6\)](#), reflecting on the Parallel Distributed Processing approach over the 25+ years since the publication of the two [PDP volumes](#). [International Conference on Learning Representations. Banff, Canada. \[ARXIV\]](#)



Industrial robots in a car factory in Germany

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