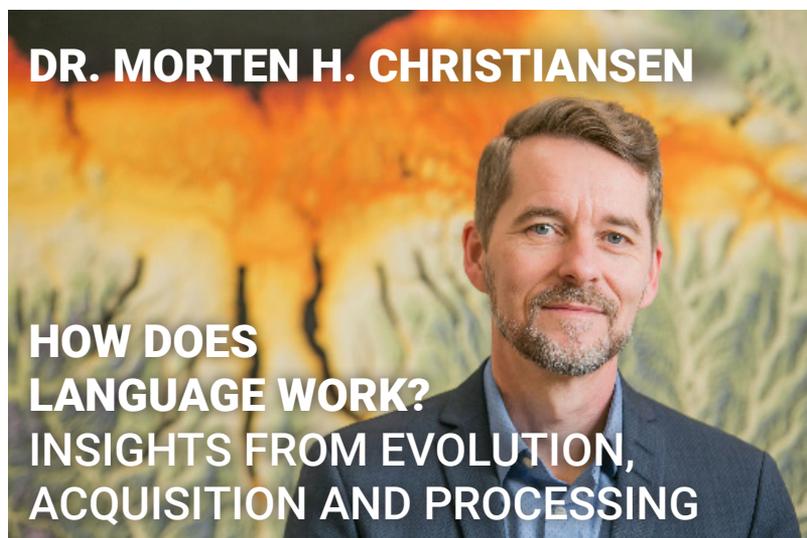




UNIVERSITY OF ALBERTA
DEPARTMENT OF PSYCHOLOGY

41st ANNUAL DISTINGUISHED SCHOLAR LECTURE SERIES

September 19, 20, and 21, 2018
3:30 PM | CCIS 1-160



How cultural evolution has shaped language to fit the brain

Why language acquisition is like skill learning

What the sounds of words tell us about their meaning



Morten H. Christiansen



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Morten H. Christiansen is the William R. Kenan, Jr. Professor of Psychology and Co-Director of the Cognitive Science Program at Cornell University as well as Professor in Cognitive Science of Language at the School of Communication and Culture, Aarhus University, Denmark, and Senior Scientist at the Haskins Labs. He is an International Partner Investigator at the International Centre for Language and Communicative Development funded by the UK Economic and Social Research Council and at the Centre of Excellence for the Dynamics of Language funded by the Australian Research Council. In addition, he currently serves as Associate Editor of Language Dynamics and Change and Frontiers in Language Sciences.

Dr. Christiansen's research focuses on the interaction of biological and environmental constraints in the evolution, acquisition and processing of language. He employs a variety of methodologies, including computational modeling, corpus analyses, statistical learning, psycholinguistic experiments, and neuroimaging. He is the author of over 200 scientific papers and has edited four books. His newest book *Creating language: Integrating evolution, acquisition, and processing* from MIT Press (2016) provides a comprehensive overview of his work over the past two decades. His work has been featured in many news outlets, including Washington Post, Scientific American, New Economist, Daily Telegraph, New Scientist, Der Spiegel, and

Times of India. He has also appeared on BBC Radio Inside Science, BBC World, BBC Wales, ABC Radio Australia, and Danish Public Radio, among others.

Dr. Christiansen has received numerous honors and awards. He was the Ida Cordelia Beam Distinguished Visiting Professor at the University of Iowa in 2010 and Visiting Professor at the University of Hong Kong in 2012. He was awarded the Cognitive Psychology Section Award from the British Psychological Society in 2013 and a Charles A. Ryskamp Research Fellowship from the American Council of Learned Societies in 2006. He was elected as Fellow of the Association for Psychological Science in 2009, made a Fellow of the Psychonomic Society in 2013, and elected as Fellow of the Cognitive Science Society in 2017. He delivered the 2009 Nijmegen Lectures at the Max Planck Institute for Psycholinguistics, the Netherlands, and was the Inaugural keynote speaker at the Edinburgh Lectures in Language Evolution, Centre for Language Evolution, University of Edinburgh, in 2017. Most recently, he received the 2018 GPSA Faculty Award from the Graduate and Professional Student Assembly at Cornell University for his graduate teaching, advising, and mentorship.

HOW DOES LANGUAGE WORK? INSIGHTS FROM EVOLUTION, ACQUISITION AND PROCESSING

- I. How cultural evolution has shaped language to fit the brain
- II. Why language acquisition is like skill learning
- III. What sounds of words tell us about their meaning

I. How cultural evolution has shaped language to fit the brain

Wednesday, September 19 | CCIS 1-160

Over the past few decades, the language sciences have seen a shift toward explaining language evolution in terms of cultural evolution rather than biological adaptation. This work has demonstrated how various nonlinguistic biases amplified by cultural transmission across generations, along with pressures from interactions between individuals within each generation, may help explain many aspects of linguistic structure observable in today's languages. As a key example, I focus in this talk on the possible contribution to language evolution of a fundamental constraint on processing: during normal linguistic interaction, we are faced with an immense challenge by the combined effects of rapid input, short-lived sensory memory, and severely limited sequence memory. To overcome this Now-or-Never bottleneck, language users must learn to compress and recode language input as rapidly as possible into increasingly more abstract levels of linguistic representation. This perspective has profound implications for the nature of language processing, acquisition, and evolution. To illustrate, I present results from a lab-based cultural evolution study and psycholinguistic experimentation. Together, these studies suggest that cultural evolution, as constrained by basic chunk-based learning and processing mechanisms, has promoted the emergence of structure in language that helps alleviate the challenge posed by the Now-or-Never bottleneck.

II. Why language acquisition is like skill learning

Thursday, September 20 | CCIS 1-160

Language acquisition is often viewed as a problem of inference, in which the child—like a “mini-linguist”—tries to piece together the abstract grammar of her native language from incomplete and noisy input. This “language-as-knowledge” viewpoint contrasts with a more recent alternative, in which the challenge of language acquisition is practical, not theoretical: by practicing across myriads of social interactions, the child gradually learns to understand and produce language. In this talk, I explore some key implications of this “language-as-skill” framework, focusing on how constraints arising from the Now-or-Never bottleneck shape acquisition. Because experience with language is fundamental to becoming a skilled language user, this perspective predicts substantial differences across individual language users as well as across languages. I discuss evidence from behavioral and computational modeling studies, highlighting experience-driven variation across individuals and languages. I conclude that language acquisition may be best construed as skill learning, on par with learning other complex human skills such as riding a bicycle or playing a musical instrument. By reconnecting language to psychological mechanisms of learning and memory, this perspective moreover offers the possibility for a reintegration of the language sciences.

III. What the sounds of words tell us about their meaning

Friday, September 21 | CCIS 1-160

Research on sound symbolism has revealed that a considerable amount of systematicity exists in the mapping between a word's phonological form and its meaning—but just how systematic is language? In this talk, I first discuss results from analyses of data from nearly two-thirds of the world's languages, indicating that across unrelated languages from different continents, some sounds are used more often than expected by chance to refer to certain concepts and ideas. Additional analyses of English suggest that language incorporates a significant amount of systematicity in form-meaning correspondences across the vocabulary. This systematicity is more pronounced for words involved in the early stages of language acquisition and reduced in later vocabulary development. I then consider further corpus analyses suggesting that additional systematicity can be found at the level of lexical categories, revealing the sound of syntax. Results from human experimentation corroborate the corpus analyses, pointing to a division of labor between arbitrariness and systematicity in the structure of the vocabulary. I conclude that the vocabulary is structured to enable systematicity for early acquired words to promote language learning, whilst also incorporating arbitrariness for later acquired words in order to facilitate communicative expressivity and processing efficiency when faced with the Now-or-Never bottleneck.

Past lecture series:

- 1975** Frank Geldard (Princeton) - "Sensory Saltation: Metastability in the Perceptual World."
- 1976** Benton Underwood (Northwestern) - "Temporal Codes for Memories: Issues and Problems."
- 1977** David Elkind (Rochester) - "The Child's Reality: Three Developmental Themes."
- 1978** Harold Kelley (UCLA) - "Personal Relationships: Their Structures and Processes."
- 1979** Robert Rescorla (Yale) - "Pavlovian Second-Order Conditioning: Studies in Associate Learning."
- 1980** Mortimer Mishkin (NIMH - Bethesda) - "Cognitive Circuits."
- 1981** James Greeno (Pittsburgh) - "Current Cognitive Theory in Problem Solving."
- 1982** William Uttal (Michigan) - "Visual Form Detection in 3-Dimensional Space."
- 1983** Jean Mandler (UC La Jolla) - "Stories, Scripts, and Scenes: Aspects of Schema Theory."
- 1984** George Collier (Rutgers) - "Learning and Motivation: Function and Mechanism."
- 1985** Alice Eagly (Purdue) - "Sex Differences in Social Behavior: A Social Role Interpretation."
- 1986** Karl Pribram (Stanford) - "Holonomic Brain Theory: Cooperative Processing in the Configural Aspects of Perception and Action."
- 1987** Abram Amsel (UT Austin) - "Behaviourism, Neobehaviourism and Cognitivism in Learning Theory."
- 1988** Robert Siegler (Carnegie-Mellon) - "How Children Discover New Strategies."
- 1989** Robert Efron (UC Martinez) - "The Decline and Fall of Hemispheric Specialization."
- 1990** Phil Johnson-Laird (Princeton) - "Human and Machine Thinking."
- 1991** Timothy Salthouse (Georgia Institute of Technology) - "Mechanisms of Age-Cognition Relations in Adulthood."
- 1992** Scott Paris (Michigan) - "Authentic Assessment of Children's Literacy and Learning."
- 1993** Bryan Kolb (Lethbridge) - "Brain Development, Plasticity, and Behaviour."
- 1994** Max Coltheart (Macquarie) - "Our Mental Lexicon: Empirical Evidence of the Modularity of Mind."
- 1995** Norbert Schwarz (Michigan) - "Cognition and Communication: Judgmental Biases, Research Methods, and the Logic of Conversation."
- 1996** Gilbert Gottlieb (UNC Chapel Hill) - "Prenatal Roots of Instinctive Behavior: A Theoretical and Experimental Exposition of Probabilistic Epigenesis."

- 1997** C. Randy Gallistel (UCLA) "Basic Conditioning from an Interval Timing Perspective."
- 1998** Harold W. Stevenson (Michigan) - "Learning from other Cultures: Achievement and Society."
- 1999** Melvyn A. Goodale (Western Ontario) - "The Origins of Vision."
- 2000** K. Anders Ericsson (Florida State) – "The Complexity and Power of Deliberate Thought: From Protocol Analysis of Exceptional Memory to the In-vivo Dissection of Expert Performance."
- 2001/02** Mark Snyder (Minnesota) – "Personality, Motivation, and Social Behavior: Understanding Individuals and Their Social Worlds."
- 2003** Michael Tomasello (Max Planck Institute for Evolutionary Anthropology) – "Lectures on Children and Chimpanzees."
- 2004** Michael J. Ryan (UT Austin) – "Sexual Selection and Sensory Exploitation."
- 2005** Gary S. Dell (Illinois) – "Slips of the tongue: The Linguistic and Freudian Traditions; Aphasic speech Errors: Testing Freud's Continuity Thesis; and Implicit learning, Phonotactic Constraints, and Speech Errors."
- 2006** Michael A. Arbib (Southern California) – "Crusoe's Brain: Social Cognition and the Mirror System."
- 2007** Richard M. Lerner (Tufts) – "Applying Developmental Science to Promote Positive Youth Development and to Enhance Community Life."
- 2008** Denise C. Park (UT Dallas) – "Images of the Aging Mind; Developing a Cultural Neuroscience of Aging; and Following Doctors' Instructions: Medical Adherence."
- 2009** David C. Rubin (Duke) – "Autobiographical Memory."
- 2011** Tomáš Paus (The Rotman Research Institute) – "How Environment and Genes Shape the Adolescent Brain"
- 2012** Chi-Yue Chiu (Nanyang Business School) – "Socially Motivated Superstitions: Mutual Constitution of Society and the Mind."
- 2013** Arie Kruglanski (Maryland) – "Three Lectures on Motivation."
- 2014** Robert Cook (Tufts) "Comparative Visual Cognition: The bird's eye view"
- 2017 (Jan.)** William H. Warren (Brown) - "The Dynamics of Perception and Action"
- 2017 (Oct.)** Michael Hasselmo (Boston) - "How We Remember: Brain Mechanisms of Episodic Memory"

Notes



Distinguished Scholar Lecture Series

The Department of Psychology Distinguished Scholar Lecture Series is a three-day public lecture series sponsored by the Department of Psychology, Faculty of Arts and Faculty of Science. Each year the Department invites a renowned psychologist to present three one-hour lectures.

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