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# Impossible Languages Mit Press

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The Secrets of Words

Essentials of Programming Languages, third edition

Democratizing Innovation

On Language

Impossible Languages

Polymorphous Linguistics

I Speak, Therefore I Am

Language Sound and Structure

The Core Language Engine

Animal Languages

The Boundaries of Babel, second edition

Extraterrestrial Languages

Language Form and Language Function

Constructing a Language

When Animals Speak

Language, Logic, and Concepts

Economy and Semantic Interpretation

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**CAROLYN LETICIA**

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The Secrets of Words MIT  
Press

An argument that the way we listen to speech is shaped by our experience with our native language. Understanding speech in our native tongue seems natural and effortless; listening to speech in a nonnative language is a

different experience. In this book, Anne Cutler argues that listening to speech is a process of native listening because so much of it is exquisitely tailored to the requirements of the native language. Her cross-linguistic study (drawing on experimental work in languages that range from English and Dutch to Chinese and Japanese) documents what is universal and

what is language specific in the way we listen to spoken language. Cutler describes the formidable range of mental tasks we carry out, all at once, with astonishing speed and accuracy, when we listen. These include evaluating probabilities arising from the structure of the native vocabulary, tracking information to locate the boundaries between words, paying attention to the way the words are

pronounced, and assessing not only the sounds of speech but prosodic information that spans sequences of sounds. She describes infant speech perception, the consequences of language-specific specialization for listening to other languages, the flexibility and adaptability of listening (to our native languages), and how language-specificity and universality fit together in our language processing system. Drawing on her four decades of work as a psycholinguist, Cutler

documents the recent growth in our knowledge about how spoken-word recognition works and the role of language structure in this process. Her book is a significant contribution to a vibrant and rapidly developing field.

Essentials of Programming Languages, third edition MIT Press  
How the scientific study of magic reveals intriguing—and often unsettling—insights into the mysteries of the human mind. What do we see when we watch a

magician pull a rabbit out of a hat or read a person's mind? We are captivated by an illusion; we applaud the fact that we have been fooled. Why do we enjoy experiencing what seems clearly impossible, or at least beyond our powers of explanation? In Experiencing the Impossible, Gustav Kuhn examines the psychological processes that underpin our experience of magic. Kuhn, a psychologist and a magician, reveals the intriguing—and often unsettling—insights into

the human mind that the scientific study of magic provides. Magic, Kuhn explains, creates a cognitive conflict between what we believe to be true (for example, a rabbit could not be in that hat) and what we experience (a rabbit has just come out of that hat!). Drawing on the latest psychological, neurological, and philosophical research, he suggests that misdirection is at the heart of all magic tricks, and he offers a scientific theory of misdirection. He explores,

among other topics, our propensity for magical thinking, the malleability of our perceptual experiences, forgetting and misremembering, free will and mind control, and how magic is applied outside entertainment—the use of illusion in human-computer interaction, politics, warfare, and elsewhere. We may be surprised to learn how little of the world we actually perceive, how little we can trust what we see and remember, and how little we are in charge of our thoughts and

actions. Exploring magic, Kuhn illuminates the complex—and almost magical—mechanisms underlying our daily activities.

*Democratizing Innovation*  
MIT Press

How animals speak to each other and to humans, from chimpanzees who learn sign language to dogs who parse the meaning of other dogs' growls. Is language what sets humans apart from other animals, as many have argued? Or do animals speak in their own

languages, to each other and to us? In *Animal Languages*, Eva Meijer explores the latter possibility. Meijer tells us about Alex, the gray parrot who knew more than one hundred words, and Chaser, the border collie who had a talent for grammar. She introduces us to Washoe, the chimpanzee who grew up with humans and learned sign language; Kosik, the elephant who spoke to humans in human language and to his female elephant companion in elephant

language; and Noc, the beluga whale who mimicked human speech. She tells us that dogs are able to interpret the meaning of other dogs' growls; that prairie dogs have alarm calls that offer informative details about intruders (specifying, among other things, size, color, and speed of approach); and that marmosets take turns in conversations and teach this skill to their offspring. But beyond all these interesting details, Meijer makes a more profound observation. Talking with

animals forces us to challenge the hierarchy of humans and other animals, and suggests a new way of thinking about language. *Animal Languages* shows us that language is broader and richer than we imagined, and that meaningful expression does not require human words. [On Language](#) MIT Press This book provides a snapshot of the field of language acquisition at the beginning of the 21st Century. It represents the multiplicity of approaches that characterize the field

and provides a review of current topics and debates, as well as addressing some of the connections between sub-fields and possible future directions for research. Impossible Languages The New Press  
Berwick and Chomsky draw on recent developments in linguistic theory to offer an evolutionary account of language and humans' remarkable, species-specific ability to acquire it. "A loosely connected collection of four essays that will fascinate anyone

interested in the extraordinary phenomenon of language." —New York Review of Books We are born crying, but those cries signal the first stirring of language. Within a year or so, infants master the sound system of their language; a few years after that, they are engaging in conversations. This remarkable, species-specific ability to acquire any human language—"the language faculty"—raises important biological questions about

language, including how it has evolved. This book by two distinguished scholars—a computer scientist and a linguist—addresses the enduring question of the evolution of language. Robert Berwick and Noam Chomsky explain that until recently the evolutionary question could not be properly posed, because we did not have a clear idea of how to define "language" and therefore what it was that had evolved. But since the Minimalist Program, developed by

Chomsky and others, we know the key ingredients of language and can put together an account of the evolution of human language and what distinguishes us from all other animals. Berwick and Chomsky discuss the biolinguistic perspective on language, which views language as a particular object of the biological world; the computational efficiency of language as a system of thought and understanding; the tension between Darwin's idea of gradual change and our contemporary

understanding about evolutionary change and language; and evidence from nonhuman animals, in particular vocal learning in songbirds.

*Polymorphous Linguistics*  
NYU Press

The process of user-centered innovation: how it can benefit both users and manufacturers and how its emergence will bring changes in business models and in public policy. Innovation is rapidly becoming democratized. Users, aided by improvements in computer and

communications technology, increasingly can develop their own new products and services. These innovating users—both individuals and firms—often freely share their innovations with others, creating user-innovation communities and a rich intellectual commons. In *Democratizing Innovation*, Eric von Hippel looks closely at this emerging system of user-centered innovation. He explains why and when users find it profitable to develop new products and



services for themselves, and why it often pays users to reveal their innovations freely for the use of all. The trend toward democratized innovation can be seen in software and information products—most notably in the free and open-source software movement—but also in physical products. Von Hippel's many examples of user innovation in action range from surgical equipment to surfboards to software security features. He shows that product and service development is

concentrated among "lead users," who are ahead on marketplace trends and whose innovations are often commercially attractive. Von Hippel argues that manufacturers should redesign their innovation processes and that they should systematically seek out innovations developed by users. He points to businesses—the custom semiconductor industry is one example—that have learned to assist user-innovators by providing them with toolkits for

developing new products. User innovation has a positive impact on social welfare, and von Hippel proposes that government policies, including R&D subsidies and tax credits, should be realigned to eliminate biases against it. The goal of a democratized user-centered innovation system, says von Hippel, is well worth striving for. An electronic version of this book is available under a Creative Commons license. [I Speak, Therefore I Am](#) MIT Press

The latter half of the 20 ...  
Language Sound and Structure MIT Press  
 An exploration of the practice of inventing languages, from speaking in tongues to utopian schemes of universality to the discoveries of modern linguistics. In *Imaginary Languages*, Marina Yaguello explores the history and practice of inventing languages, from religious speaking in tongues to politically utopian schemes of universality to the discoveries of modern linguistics. She looks for

imagined languages that are autonomous systems, complete unto themselves and meant for communal use; imaginary, and therefore unlike both natural languages and historically attested languages; and products of an individual effort to lay hold of language. Inventors of languages, Yaguello writes, are madly in love: they love an object that belongs to them only to the extent that they also share it with a community. Yaguello investigates the sources of imaginary

languages, in myths, dreams, and utopias. She takes readers on a tour of languages invented in literature from the sixteenth to the twentieth century, including that in More's *Utopia*, Leibniz's "algebra of thought," and Bulwer-Lytton's linguistic fiction. She examines the linguistic fantasies (or madness) of Georgian linguist Nikolai Marr and Swiss medium Hélène Smith; and considers the quest for the true philosophical language. Yaguello finds two abiding (and somewhat

contradictory) forces: the diversity of linguistic experience, which stands opposed to unifying endeavors, and, on the other hand, features shared by all languages (natural or not) and their users, which justifies the universalist hypothesis. Recent years have seen something of a boom in invented languages, whether artificial languages meant to facilitate international communication or imagined languages constructed as part of science fiction worlds. In

Imaginary Languages (an updated and expanded version of the earlier *Les Fous du langage*, published in English as *Lunatic Lovers of Language*), Yaguello shows that the invention of language is above all a passionate, dizzying labor of love.

*The Core Language Engine* MIT Press

A groundbreaking, comprehensive formal theory of grammatical person that recasts its empirical foundations and re-envision its theoretical core. *Impossible Persons*,

Daniel Harbour's comprehensive and groundbreaking formal theory of grammatical person, upends understanding of a universal and ubiquitous grammatical category. Breaking with much past work, Harbour establishes three core theses, one empirical, one theoretical, and one metatheoretical. Together, these redefine the data subsumed under the rubric of "person," simplify the feature inventory that a theory of person must posit, and restructure the

metatheory in which feature theory as a whole resides. At its heart, Impossible Persons poses a simple question of the possible versus the actual: in how many ways could languages configure their person systems, in how many do they configure them, and what explains the size and shape of the shortfall? Harbour's empirical thesis—that the primary object of study for persons are partitions, not syncretisms—transforms a sea of data into a categorical problem of the

attested and the absent. Positing, innovatively, that features denote actions, not predicates, he shows that two features alone generate all and only the attested systems. This apparently poor inventory yields rich explanatory dividends, covering the morphological composition of person, its interaction with number, its connection to space, and properties of its semantics and linearization. Moreover, the core properties of this approach are shared with Harbour's earlier work on

number features. Jointly, these results establish an important metatheoretical corollary concerning the balance between richness of feature semantics and restrictiveness of feature inventories. This corollary holds deep implications for how linguists should approach feature theory in future.

**Animal Languages** MIT Press

Examines the creation of imaginary languages in history and fiction as an expression of the search for an original and primitive or universal

language. The author's other works include "Les Mots et les Femmes" (1978) and "Alice au pays du Language" (1981). The Boundaries of Babel, second edition MIT Press The new edition of a pioneering book that examines research at the intersection of contemporary theoretical linguistics and the cognitive neurosciences. In The Boundaries of Babel, Andrea Moro describes an encounter between two cultures: contemporary theoretical linguistics and the

cognitive neurosciences. As a leading theoretical linguist in the generative tradition and also a neuroscientist, Moro is uniquely equipped to tell this story. Moro examines what he calls the "hidden" revolution in contemporary science: the discovery that the number of possible grammars is not infinite and that their number is biologically limited. This will require us to rethink not just the fundamentals of linguistics and neurosciences but also our view of the human

mind. Moro searches for neurobiological correlates of "the boundaries of Babel"—the constraints on the apparent chaotic variation in human languages—by using an original experimental design based on artificial languages exploiting neuroimaging techniques. This second edition includes a new chapter in which Moro extends the exploration of the boundaries of Babel in search of the source of order with which all human languages are endowed. Reflecting on

the emerging methodology that obtains physiological data from awake brain surgery, Moro shifts from considering where the neurophysiological processes underlying linguistic competence take place—that is, where neurons are activated—to considering the neuronal code involved in these processes—that is, what neurons communicate to each other. This edition also features a substantive new foreword by Noam Chomsky synthesizing the major

issues theoretical syntax will face in the near future. *Extraterrestrial Languages* MIT Press  
An engaging introduction to the use of game theory to study linguistic meaning. In *Meaningful Games*, Robin Clark explains in an accessible manner the usefulness of game theory in thinking about a wide range of issues in linguistics. Clark argues that we use grammar strategically to signal our intended meanings: our choices as speaker are conditioned by what

choices the hearer will make interpreting what we say. Game theory—according to which the outcome of a decision depends on the choices of others—provides a formal system that allows us to develop theories about the kind of decision making that is crucial to understanding linguistic behavior. Clark argues the only way to understand meaning is to grapple with its social nature—that it is the social that gives content to our mental lives. Game

theory gives us a framework for working out these ideas. The resulting theory of use will allow us to account for many aspects of linguistic meaning, and the grammar itself can be simplified. The results are nevertheless precise and subject to empirical testing. Meaningful Games offers an engaging and accessible introduction to game theory and the study of linguistic meaning. No knowledge of mathematics beyond simple algebra is

required; formal definitions appear in special boxes outside the main text. The book includes an extended argument in favor of the social basis of meaning; a brief introduction to game theory, with a focus on coordination games and cooperation; discussions of common knowledge and games of partial information; models of games for pronouns and politeness; and the development of a system of social coordination of reference.

**Language Form and**

**Language Function** MIT Press

The two basic approaches to linguistics are the formalist and the functionalist approaches. In this engaging monograph, Frederick J. Newmeyer, a formalist, argues that both approaches are valid. However, because formal and functional linguists have avoided direct confrontation, they remain unaware of the compatibility of their results. One of the author's goals is to make each side accessible to

the other. While remaining an ardent formalist, Newmeyer stresses the limitations of a narrow formalist outlook that refuses to consider that anything of interest might have been discovered in the course of functionalist-oriented research. He argues that the basic principles of generative grammar, in interaction with principles in other linguistic domains, provide compelling accounts of phenomena that functionalists have used to try to refute the

generative approach.

**Constructing a Language** Oxford University Press

There are no men so dull and stupid, not even idiots, as to be incapable of joining together different words, and thereby constructing a declaration by which to make their thoughts understood.... On the other hand, there is no other animal, however perfect or happily circumstanced which can do the like.—Descartes  
Language is more like a snowflake than a giraffe's

neck. Its specific properties are determined by laws of nature, they have not developed through the accumulation of historical accidents.—Noam Chomsky In I Speak, Therefore I Am, the Italian linguist and neuroscientist Andrea Moro composes an album of his favorite quotations from the history of linguistics, beginning with the Book of Genesis and the power of naming and concluding with Noam Chomsky's metaphor that language is a snowflake. Moro's



seventeen linguistic thoughts and his commentary on them display the humanness of language: our need to name and interpret this world and create imaginary ones, to express and understand ourselves. This book is sure to delight anyone who enjoys the ineffable paradox that is human language.

*When Animals Speak* MIT Press

*Language in Action* demonstrates the viability of mathematical research into the foundations of

categorial grammar, a topic at the border between logic and linguistics. Since its initial publication it has become the classic work in the foundations of categorial grammar. A new introduction to this paperback edition updates the open research problems and records relevant results through pointers to the literature. Van Benthem presents the categorial processing of syntax and semantics as a central component in a more general dynamic logic of

information flow, in tune with computational developments in artificial intelligence and cognitive science. Using the paradigm of categorial grammar, he describes the substructural logics driving the dynamics of natural language syntax and semantics. This is a general type-theoretic approach that lends itself easily to proof-theoretic and semantic studies in tandem with standard logic. The emphasis is on a broad landscape of substructural categorial logics and their proof-

theoretical and semantic peculiarities. This provides a systematic theory for natural language understanding, admitting of significant mathematical results. Moreover, the theory makes possible dynamic interpretations that view natural languages as programming formalisms for various cognitive activities.

**Language, Logic, and**

**Concepts** MIT Press

“An elegant and accessible” investigation of quantum mechanics for non-specialists—“highly

recommended” for students of the sciences, sci-fi fans, and anyone interested in the strange world of quantum physics (Forbes) Rules of the quantum world seem to say that a cat can be both alive and dead at the same time and a particle can be in two places at once. And that particle is also a wave; everything in the quantum world can be described in terms of waves—or entirely in terms of particles. These interpretations were all established by the end of the 1920s, by Erwin

Schrödinger, Werner Heisenberg, Paul Dirac, and others. But no one has yet come up with a common sense explanation of what is going on. In this concise and engaging book, astrophysicist John Gribbin offers an overview of six of the leading interpretations of quantum mechanics. Gribbin calls his account “agnostic,” explaining that none of these interpretations is any better—or any worse—than any of the others. Gribbin presents

the Copenhagen Interpretation, promoted by Niels Bohr and named by Heisenberg; the Pilot-Wave Interpretation, developed by Louis de Broglie; the Many Worlds Interpretation (termed “excess baggage” by Gribbin); the Decoherence Interpretation (“incoherent”); the Ensemble “Non-Interpretation”; and the Timeless Transactional Interpretation (which theorized waves going both forward and backward in time). All of these interpretations are

crazy, Gribbin warns, and some are more crazy than others—but in the quantum world, being more crazy does not necessarily mean more wrong.

### **Economy and Semantic Interpretation** MIT Press

From the Model T to today's "lean manufacturing": the assembly line as crucial, yet controversial, agent of social and economic transformation. The mechanized assembly line was invented in 1913 and has been in continuous operation ever since. It is

the most familiar form of mass production. Both praised as a boon to workers and condemned for exploiting them, it has been celebrated and satirized. (We can still picture Chaplin's little tramp trying to keep up with a factory conveyor belt.) In America's Assembly Line, David Nye examines the industrial innovation that made the United States productive and wealthy in the twentieth century. The assembly line—developed at the Ford Motor Company in 1913 for the

mass production of Model Ts—first created and then served an expanding mass market. It also transformed industrial labor. By 1980, Japan had reinvented the assembly line as a system of “lean manufacturing”; American industry reluctantly adopted the new approach. Nye describes this evolution and the new global landscape of increasingly automated factories, with fewer industrial jobs in America and questionable working conditions in developing countries. A century after

Ford's pioneering innovation, the assembly line continues to evolve toward more sustainable manufacturing. Types and Programming Languages MIT Press Two distinguished linguists on language, the history of science, misplaced euphoria, surprising facts, and potentially permanent mysteries. In *The Secrets of Words*, influential linguist Noam Chomsky and his longtime colleague Andrea Moro have a wide-ranging conversation, touching on

such topics as language and linguistics, the history of science, and the relation between language and the brain. Moro draws Chomsky out on today's misplaced euphoria about artificial intelligence (Chomsky sees “lots of hype and propaganda” coming from Silicon Valley), the study of the brain (Chomsky points out that findings from brain studies in the 1950s never made it into that era's psychology), and language acquisition by children. Chomsky in turn invites Moro to

describe his own experiments, which proved that there exist impossible languages for the brain, languages that show surprising properties and reveal unexpected secrets of the human mind. Chomsky once said, “It is important to learn to be surprised by simple facts”—“an expression of yours that has represented a fundamental turning point in my own personal life,” says Moro—and this is something of a theme in their conversation. Another theme is that not

everything can be known; there may be permanent mysteries, about language and other matters. Not all words will give up their secrets.

### **Impossible Histories**

MIT Press

James McCawley (1938-1999) was one of the most significant linguists of the latter half of the twentieth century. His legacy to a generation of linguists encompasses not only his work in phonology, syntax, semantics, pragmatics, and the philosophy of language but also his

emphasis on bridging research in linguistics with that in other disciplines, from anthropology and psychology to physics and biology. This book, written by his former students—all now scholars in their own right—pays tribute to McCawley by pursuing questions about language that engaged him during his career. The variety of perspectives in these essays reflects McCawley's eclecticism as well his belief that what is important in scholarly work is not the analytic framework used but the

insights reached. The book considers topics in phonology; syntax, with several essays on Indic languages (in which McCawley had a special interest) as well as one on African-American English; tense, aspect, and mood; semantics and pragmatics, with essays in

these areas grouped together to reflect the intertwining of McCawley's work on these subjects; knowledge of language; and the treatment of language, with its implicit colonial biases, in the 11th edition of Encyclopedia

Britannica.

**Language in Action**  
Springer

The relationship between story and game, and related questions of electronic writing and play, examined through a series of discussions among new media creators and theorists.