



Surfaces and Essences: Analogy as the Fuel and Fire of Thinking

By Douglas Hofstadter, Emmanuel Sander

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Is there one central mechanism upon which all human thinking rests? Cognitive scientists Douglas Hofstadter and Emmanuel Sander argue that there is. At this core is our incessant proclivity to take what we perceive, to abstract it, and to find resemblances to prior experiences—in other words, our ability to make analogies.

In *The Essence of Thought*, Hofstadter and Sander show how analogy-making pervades our thought at all levels—indeed, that we make analogies not once a day or once an hour, but many times per second. Thus, analogy is the mechanism that, silently and hidden, chooses our words and phrases for us when we speak, frames how we understand the most banal everyday situation, guides us in unfamiliar situations, and gives rise to great acts of imagination.

We categorize because of analogies that range from simple to subtle, and thus our categories, throughout our lives, expand and grow ever more fluid. Through examples galore and lively prose peppered, needless to say, with analogies large and small, Hofstadter and Sander offer us a new way of thinking about thinking.

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Editorial Review

From [Booklist](#)

Starred Review In what Einstein cherished as the “happiest thought” of his life, Hofstadter and Sander discern a mental process that empowers the mind not just of the rare genius but also of the ordinary person. That process—the framing of analogies—received favorable attention from Plato and Aristotle, Kant and Nietzsche. But many modern empiricists, including Hobbes and Locke, have warned against analogies as intellectual snares. And many tunnel-visioned students see in analogical thinking only the logic-chopping of an IQ test. Hofstadter and Sander tear through the misperceptions, demonstrating the astonishing conceptual power of analogies—manifest when mathematicians venture from real to imaginary numbers, when physicists leap from photons to vector bosons. That power shows up in unexpectedly ubiquitous, ordinary ways, though, as we meet everyday challenges by categorizing the features of those challenges and by dredging up forgotten but relevant past experiences to interpret them. Surprisingly, only analogies enable us to recognize deep essences behind surface appearances and to weigh competing options in national policy or personal life. Readers do confront the risks of false and stereotypical analogies, but soon realize that analogy-making is the pilot light of creativity—and essential for adapting to a changing world. A revelatory foray into the dynamics of the mind. --Bryce Christensen

Review

Science

“*Surfaces and Essences* warrants a place alongside *Gödel, Escher, Bach* and major recent treatments of human cognition. Analogy is not the endpoint of understanding, but its indispensable beginning.”

Nature

“Lucid and, page for page, a delight to read.... [*Surfaces and Essences* contains] gems of insight.”

Wall Street Journal

"Clear, lively, and personal."

Globe and Mail (Canada)

“Knowing what makes a duck a bird and what makes a plane not a bird may not seem like very profound mental feats—but Douglas Hofstadter and Emmanuel Sander see such cognitive connections as part of an extraordinarily profound process.... Be prepared to become hyper-conscious of the myriad of analogies one makes every moment of every day.... The end result is a book that is ambitious and provocative.”

Booklist, starred review

“A revelatory foray into the dynamics of the mind.”

Library Journal

“Like Hofstadter’s Pulitzer Prize-winning *Gödel, Escher, Bach*, this work executes, from a very complex thesis, an understanding by general readers while also appealing to specialists in philosophy of mind and cognitive science.”

Kirkus Reviews, starred review

“How do we know what we know? How do we know at all? With an enjoyable blend of hard science and

good storytelling, Hofstadter and French psychologist Sander tackle these most elusive of philosophical matters.... [I]t's worth sticking with [Hofstadter's] long argument, full of up-to-date cognitive science and, at the end, a beguiling look at how the theory of relativity owes to analogy.... First rate popular science: difficult but rewarding."

Melanie Mitchell, Professor of Computer Science, Portland State University, and author of *Complexity: A Guided Tour*

"Hofstadter and Sander's book is a wonderful and insightful account of the role of analogy in cognition. Immensely enjoyable, with a plethora of fascinating examples and anecdotes, this book will make you understand your own thought processes in a wholly new way. It's analogy all the way down!"

Steven Pinker, Harvard College Professor of Psychology, Harvard University, and author of *How the Mind Works* and *The Stuff of Thought*

"I am one of those cognitive scientists who believe that analogy is a key to explaining human intelligence. This magnum opus by Douglas Hofstadter, who has reflected on the nature of analogy for decades, and Emmanuel Sander, is a milestone in our understanding of human thought, filled with insights and new ideas."

Gerald Holton, Professor of Physics and History of Science, Emeritus, Harvard University

"Hofstadter and Sander's book starts with two audacious goals: to show that none of us can think a minute without using a variety of analogies, and that becoming aware of this fact can help us think more clearly. Then, patiently and with humor, the authors prove their claims across the whole spectrum, from everyday conversation to scientific thought processes, even that of Einstein."

Nancy J. Nersessian, Professor of Cognitive Science, Georgia Institute of Technology, and author of *Creating Scientific Concepts*

"Placing analogy at the core of cognition Hofstadter and Sander provide a persuasive answer to the question 'what is thought?' Analogy is the mechanism underlying the myriad instances of concept formation and categorization we perform throughout any day, whether unconscious or explicit, without which there would be no thought. They mount a compelling case through analysis of a wealth of insightful—imaginative and real—exemplars, from everyday thinking to the highest achievements of the human mind, which are sure to persuade a broad range of readers."

Elizabeth F. Loftus, Distinguished Professor, University of California, and author of *Eyewitness Testimony*

"*Surfaces and Essences* is a mind-boggling argument for the central role that analogies play in human thought. Hofstadter and Sander's witty and profound masterpiece will leave you thinking about thinking in totally new ways."

Donald Norman, author of *Living with Complexity* and *The Design of Everyday Things*

"Doug Hofstadter and Emmanuel Sander rip apart everyday understanding to reveal insights of both mind and universe. The key is to recognize that analogies and concepts are the same things, that they are ubiquitous, universal, and key to understanding human thought. Easy to read, but deep to comprehend. The result is both enjoyable and profound."

Barbara Tversky, Professor Emerita of Psychology, Stanford University, and Professor of Psychology and Education, Columbia Teachers College

"*Surfaces and Essences* has much of both. And more. This book is fun! And serious. Category, analogy (and similarity) are at the core of cognition. On every page, you will find delights: you will be informed, you will

be puzzled; you will agree vehemently and you will disagree just as vehemently; you will ponder. And you will return for more.”

About the Author

Douglas Hofstadter is Distinguished College of Arts and Sciences Professor of Cognitive Science and Comparative Literature at Indiana University. His previous books include *Gödel, Escher, Bach* (which won the Pulitzer Prize for General Nonfiction in 1980) and *Fluid Concepts and Creative Analogies*. **Emmanuel Sander** is Professor of Cognitive and Developmental Psychology at the University of Paris (Saint-Denis), specializing in the study of analogy-making and categorization and their connections to education. Among his previous works is the book *Analogy, from the Naïve to the Creative*.

Users Review

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