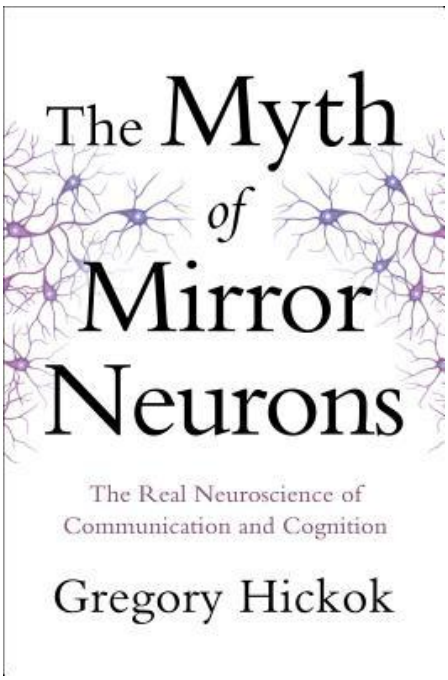

The Myth of Mirror Neurons: The Real Neuroscience of Communication and Cognition

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In 1992, a group of neuroscientists from Parma, Italy, reported a new class of brain cells discovered in the motor cortex of the macaque monkey. These cells, later dubbed mirror neurons, responded equally well during the monkey's own motor actions, such as grabbing an object, and while the monkey watched someone else perform similar motor actions. Researchers speculated that the neurons allowed the monkey to understand others by simulating their actions in its own brain.
Mirror neurons soon jumped species and took human neuroscience and psychology by storm. In the late 1990s theorists showed how the cells provided an elegantly simple new way to explain the evolution of language, the development of human empathy, and the neural foundation of autism. In the years that followed, a stream of scientific studies implicated mirror neurons in everything from schizophrenia and drug abuse to sexual orientation and contagious yawning.

In *The Myth of Mirror Neurons*, neuroscientist Gregory Hickok reexamines the mirror neuron story and finds that it is built on a tenuous foundation—a pair of codependent assumptions about mirror neuron activity and human understanding. Drawing on a broad range of observations from work on animal behavior, modern neuroimaging, neurological disorders, and more, Hickok argues that the foundational assumptions fall flat in light of the facts. He then explores alternative explanations of mirror neuron function while illuminating crucial questions about human cognition and brain function: Why do humans imitate so prodigiously? How different are the left and right hemispheres of the brain? Why do we have two visual systems? Do we need to be able to talk to understand speech? What's going wrong in autism? Can humans read minds?

The Myth of Mirror Neurons not only delivers an instructive tale about the course of scientific progress—from discovery to theory to revision—but also provides deep insights into the organization and function of the human brain and the nature of communication and cognition.

The Myth of Mirror Neurons: The Real Neuroscience of Communication and Cognition Details

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From Reader Review The Myth of Mirror Neurons: The Real Neuroscience of Communication and Cognition for online ebook

Pandit says

'Mirror Neurons' are the discovery that for some primates, when an action is observed, similar neurons fire in the observer - such as observing someone reach for something, the observer's motor neurons show similar firing to the animal observed.
I was always rather cautious about this 'revolution' in cognitive science. How does a degree of 'acting out' make us understand something better? Hickok nails all the dubious aspects of this idea in psychology, while presenting interesting discussions on cognition, and related fields.

Andrew Marr says

Although the title make cause one to think it, this book does NOT deny the existence of mirror neurons. The myth the author talks about is a serious overrating of what mirror neurons can do in human beings. The discovery that the same neurons in the brains of macaque monkeys fire when they do an action or see the action done, such as grabbing a banana remains intact. It is the extension of the motor simulation to explaining human language and imitation that Hickock contests. Two historical points: 1)Up to the discovery of mirror neurons, the computational system of the brain was somewhat overrated; 2) the discovery of mirror neurons triggered a revival of the highly discredited motor theory of language skills in humans. Hickock explains at length how the same problems that discredited the motor theory of language remain in force, notwithstanding the difficulty of killing zombies. He discusses the evidence for high-level computational processing in the human brain in language use and in imitation. What mirror neurons do is ground the computational work in the brain in the motor areas of the brain. Hickock suggestss that mirror neurons seem to be about the same in macaques and humans but macaques do not talk and they do not imitiave very much--certainly not anywhere near on a human skill. Hickock discusses autism and the theory that it is caused by a deprivation of mirror neuron activity. Hickock gives reasons why this does not work as part of a broader questioning of all deprivation theories of autism. In its place, Hickock cites evidence that autism is caused by overload in many areas. It is well-known that autistic persons are hypersensitive to sound and other sensory inputs such as certain colors. There is also growing evidence that autistic persons are huper-sensitive to the other people; that is, they have an overload of empathy that is overwhelming rather than a lack. Where we seem to end up, for the time being anyway, is a mirror neuron system that grounds a complex computational cognitive set up apps (to use the computer analogy). For those interested in René Girard's thought who see the discovery of mirror neurons as explaining Girard's notions of mimetic desire: mirror neurons don't do as much as the hype has suggested but they are very much in our bodies and they do play a role. The instinctive reaction to stimuli still seems to point to the preconscious element of mimetic desire, or at least part of it. The paradigm that Hickock is moving us toward suggests that it is not mirror neurons but the explosion of cognitive skills in the brain that takes humans out of instinct into learning by experience. Imitation, so fundamental to those exploring Girard's thought, takes over from what instinct did in animals. Those skilled in neurology and related issues might found it useful to follow up this notion to see if it holds significant explanatory value. In any case, everyone who has been excited about mirror neurons and especially those who have cited the discovery as helpful to understanding humans should read this book to see where at least some scientists are now taking it. Hickock hasn't just razed the barn; he has also called in the carpenters.

David says

The main flaw in this book is that it repeatedly argues that, if there is some other part of the brain that can account for how humans (or some other animal) perform some function, then why would we have mirror neurons to also participate in that function, when that would mean that mirror neurons would be redundant. My immediate answer to that question (based solely on what I'd previously read in the non-scientific, popular press) is that the function of mirror neurons may be to create the feeling and sensation of empathy. Thus, even though other parts of our brain are able to perform, imitate, and understand various motor functions, it could be that only our mirror neurons enable us to not merely picture or understand in an intellectual sense what it's like to be another person performing some action with some or other goal in mind, but to actually FEEL what it's like to be that other person, in a way that allows us to experience the world emotionally from the other person's perspective.

Nevertheless, this flaw is not ultimately fatal to the arguments put forward by this book, since those arguments are, themselves (ironically) somewhat redundant. And while this well-researched book doesn't quite live up to the promise of the title--in that it doesn't quite establish that mirror neurons are a myth--the book does an excellent job of raising significant doubts about their existence. Certainly, this book has convinced me that, at the very least, we should not take the existence of mirror neurons for granted without additional evidence beyond what had been established, at least at the time of the publication of this book (August 2014).

YHC says

Mirror neurons was first introduced in 1992, at that time it was experiments on monkeys to explain that the actions actually fired certain spots on the brain simply by observing could trigger learning. "Neurons fire when a subject reaches for an object as well as when a subject observes someone else reach for an object. This simple but profound feature, which suggests a relationship between knowledge of self-actions and an understanding of the intentions of others, generated multidisciplinary theories about all kinds of human behavior and thought, from language to empathy. "
However Hickok brought up many of his researches to argue that on human it's much more complicated.

Perhaps the best summary of his book is that of Steven Pinker, who is quoted on the sleeve of the book as saying:

"Every now and again an idea from science escapes from the lab and takes on a life of its own as an explanation for all mysteries, a validation of our deepest yearnings, and irresistible bait for journalists and humanities scholars ... Hickok puts an end to this monkey business by showing that mirror neurons do not, in fact, explain language, empathy, society, and world peace. But this is not a negative exposé - the reader of this book will learn a great deal of the contemporary sciences of language, mind, and brain, and will find that the reality is more exciting than the mythology."

This is somehow not very easy to fully understand, I have to side check out on website to make sure what the author actually stand for. i guess the translation and my understanding on neuroscience are limited.

Darren says

This book is a prime example of how correlation does not mean causation, and overturns the traditional assumptions about mirror neurons.

"Every now and again an idea from science escapes from the lab and takes on a life of its own as an explanation for all mysteries, a validation of our deepest yearnings, and irresistible bait for journalists and humanities scholars… Hickok puts an end to this monkey business by showing that mirror neurons do not, in fact, explain language, empathy, society, and world peace. But this is not a negative exposé — the reader of this book will learn a great deal of the contemporary sciences of language, mind, and brain, and will find that the reality is more exciting than the mythology." -Steven Pinker

The Myth of Mirror Neurons is a fascinating, game-changing book. It explains the details of research studies and its reasoning is thoroughly backed up by citations from the scientific literature. It is not an easy read; some of the concepts are hard to grasp at first, especially for those not familiar with the relevant literature and the terminology. But it offers a valuable lesson in how scientists can be led down the wrong path and how errors can be compounded. It shows how important it is to make sure research data justify the conclusions, to search rigorously for disconfirming evidence, and to make sure alternative explanations have been considered and adequately ruled out. The book accomplishes two goals: it sheds serious doubt on almost everything that has been written about mirror neurons, and it describes cutting edge neuroscience research that may eventually lead us to a better understanding of how communication and cognition really work. No real answers, but plenty of questions. And after all, one of the most important things in science is knowing which questions to ask.

Gary Beauregard Bottomley says

You get two things with this book. You get an incredible interesting exposition on the workings of the mind (consciousness) and a narrative that ties that story together by showing how mirror neurons almost certainly aren't what you thought they were.

The author does not reject the existence of mirror neurons in humans, but he does poke holes in most of what you probably have been told about them in a host of other books and articles. He gives very nuanced arguments to how the available data doesn't always mean what mirror neuron experts say they do. The author is an expert in the understanding of how we communicate. He'll delve into the "motor theory of speech" and how that deservedly fell out of disrepute over time and was resurrected only because that gave mirror neurons such a central role. The results of various experiments supporting that hypothesis are not always best explained by the ways mirror neuron advocates claim and sometimes they ignore the better explanations.

This is a real strength of the book. While showing how better explanations for the experiments and data are available which don't excessively rely on mirror neurons the author never shies way from educating the listener on the embodied processes of thinking.

I love neuroscience and books about the workings of the mind and human behavior. While reading such books, mirror neurons kept popping up in sections of those books, but over time, I started to realize that the

advocates for the magical workings of the mirror neurons did not always make sense and there seemed to be better explanations available. This book tells me why my caution radar was beeping.

I'm sure a lot of experts in the field probably hate this book, but I can recommend this book because it will teach the listener to be cautious about mirror neuron claims, and help the listener learn a little bit more about the way the brain works without overwhelming the listener with too many names of brain parts which I only end up forgetting.

Ginger Campbell says

This is an excellent overview of the history of a topic that has really taken off in recent years. The author has spent his career studying the neuroscience of language. In this book he explains why although he thinks mirror neurons represent an important discovery many popular interpretations about their function do not stand up to the scientific evidence.

Kayson Fakhar says

A really interesting book trying to reduce the irrational hype around mirror neurons. Well, not sure who’s the audience tho since it had a bit of jargon, although explained in appendixes, and was a bit basic for experts but overall I feel fine with the level of expertise.

Joseph Carrabis says

The Myth of Mirror Neurons is a great find for lay and experienced people wanting to know what all the hype is about. I appreciated Hickok's stand that mirror neurons do exist, just not in the way most people believe and they don't do any of the hype attributed to them. Good stuff.

Nick says

A curious polemic. The author is a dedicated toiler in the research vineyards of the brain, and has a strong contrarian view of the Italian team's discovery of mirror neurons. Hickok's main complaint is that the what-iffing has gotten way ahead of the evidence. So he talks about a number of the speculative applications of the idea of mirror neurons, and points out that the science that underpins them is incomplete. Well, yes. That's what speculation is. The whole process of science is moved forward by hypotheses that are tested with carefully designed experiments -- and also by what-iffing, surely. Hickok thus comes across as a grumpy naysayer rather than someone who's genuinely engaged in trying to push the science forward. I'm not sure that this should have been a book -- an article in Science or Scientific American would have been more to the point. Hickok is absolutely right, that the idea of mirror neurons as the explanation du jour for every kind of mental phenomenon is way ahead of the proof. But speculation and imagination are absolutely essential parts of science. And science has its fads like any other branch of human experience. Yes, it's time to test all the speculation and see what sticks. But no, it's not time to say that mirror neurons are a "myth." Not yet, at any rate.

Gy says

Monkey see, monkey do....

The author Gregory Hickok was a professor in Department of Cognitive Sciences at University of California, Irvine. Since 2005 he is a Director Center for Cognitive Neuroscience. I found his participatory works on many fields. One of it is the NLP.

The discovery and characterization of DNA in 1953 changed biology forever. DNA is the blueprint for life, the key to understanding how organisms are built, how they evolve, and how things can go wrong in disease. In 2000, psychologist V.S. Ramachandran invoked the epochal impact of DNA in a prediction regarding a then recently discovered class of brain cells, mirror neurons. He claimed:"I predict that mirror neurons will do for psychology what DNA did for biology."
Judging from the title of Ramachandran's TED talk on mirror neurons delivered in 2010, "The Neurons that Shaped Civilization," a decade of intense research on the cells seems to have confirmed his predictions.
SO, WHAT MIRROR NEURONS ARE?
In 2008, Marco Iacoboni, a neuroscientist at UCLA, echoed Ramachandran's enthusiasm for this class of brain cells: "We achieve our very subtle understanding of other people thanks to certain collections of special cells in the brain called mirror neurons. These are the tiny miracles that get us through the day. They are at the heart of how we navigate through our lives. They bind us with each other, mentally and emotionally. . . . Mirror neurons undoubtedly provide, for the first time in history, a plausible neurophysiological explanation for complex forms of social cognition and interaction."
This book, written on handy, concise way is dedicated to mirror neurons research, all those took a part in it, and to mirrors itself, their role, functioning, to the mental machinery that mirrors are a part of it, correlations between mirrors and this global modul of the encephalon.
When a reader delves into mystery that surrounds mirrors, soon will have to face that yet there are those special neural cells, shortly mirrors, that are collectively observing other people we are interacting, passively or actively, they are not enough for function neuroscientists claim they are for. Reader will soon understand that despite monkeys have a large set of mirrors and they are able to use it to mimic or imitate others...ops to imitate!!!? If ever been in sales and your trainer introduced you the concept of "rapport" which is a part of neurolinguistic programming then you know what I'm talking about. You want to sell something? You must win the prospect! Actually, NLP teaches us how to get into sync with others in order to achieve the final purpose of interaction which can be friendship or just to sell something to them. To get into the sync, NLP claims when we interact with others and in order to be able get along with them, we always intuitively mimic them! An here comes the mirror neurons! ...ops to imitate!!!? Yes, mirrors are to help us imitate with purpose, while monkeys, well, they do imitate, but they lack mental machinery we have, to give the imitation a purpose. How mirrors work, how we imitate? Well, read this book to find out!
For the end, I'd really say thank you to professor for reflecting on one of the harshest disorder humans are incapable to battle, and that's the disorder of "broken mirrors", the Autism!

Nice book! Wishing pleasant reading to all.

Ioannis Savvas says

Οι νευρ?νες κ?τοπτρα ?γιναν ξαφνικ? μ?δα και οι επιστ?μονες σε ?λον τον κ?σμο β?λθηκαν να τους μελετο?ν και να αποδ?δουν σε αυτο?ς πολλ?ς ικαν?τητες του εγκεφ?λου, σε μια φρεν?τιδα αν?πτυξης ν?ων θεωρι?ν. Το βιβλ?ο β?ζει μια τ?ξη στην κατ?σταση και επαναφ?ρει το θ?μα σε μια κριτικ? και σκεπτικιστικ? οπτικ?.

Frederick Leonhardt says

If something is too good to be true, it probably is. I have a keen interest in psychology, and mirror neurons are all the rage. I read Hickok's book to get some perspective. As I thought, there's a lot of hype concerning mirror neurons that does not square with the scientific data. Without going into detail, many use mirror neurons to argue that we are hard wired for empathy, that there is an evolutionary reason why we engage in empathy and perspective taking. Well, Hickok points out that the story of mirror neurons is being used to bolster a decidedly liberal position. Hickok provides amble evidence to suggest that the myth of mirror neurons has left the confines of scientific data and is being used to sell a particular liberal agenda. Now, interestingly, I'm reading the book Homo Deus by Yuval Harari and he has a section on how science needs religion and vice versa. Why? Because science cannot make any moral or ethical pronouncements. Science can tell us about the biology of conception and fetus development but cannot say when life starts. For that, science needs religion. Now, Harari calls liberalism a religion. So, liberals are spreading the gospel of mirror neurons. As long as we see it for what it is, there's nothing wrong really. Hickok's main complaint is that the religion of mirror neurons is being sold as science. Hickok's book is a great read if you'd like to learn about mirror neurons, and also learn about an example of where science has jumped the tracks into myth (or maybe even religious proselytizing).

Rossdavidh says

So, in case you didn't know, "mirror neurons" are one of the only topics in modern neuroscience that have broken out into popular consciousness. I got asked by a woman about the title of the book, when I was reading it in a coffeeshop. She was mystified by the title, because she'd heard about mirror neurons and seemed a little worried that they might be a myth.

The title is a bit of an overstatement, but then "Mirror Neurons Have Been Overhyped" probably wouldn't sell as well. In case you have evaded the hype prior to now, here's a short description. Mirror neurons are neurons in your (or a monkey's) brain that fire both when you take an action (for example grasping a grape in preparation for eating it), and when you see somebody else take that same action. They were discovered accidentally in the 90's, and ever since then people in that line of work have been trying to figure out what this means.

The human brain is something we all have some interest in, if we have one, and yet it's workings are not very well understood. This combination means that whenever something new about it is discovered, there is a high risk of trying to use that something to explain everything about the brain which we very much want to understand, but don't. Mirror neurons have been pressed into service to explain empathy, theory of mind, or perhaps even language or empathy.

Well, yes. That is almost certainly more than mirror neurons can truly explain, and much like new technologies can be overhyped and then subject to a reaction of disappointment, mirror neurons are going

through a backlash of sorts right now. Hickok writes a readable and reasoned book to debunk the too-extravagant claims made for what mirror neurons do or enable, and the problem I had with it was that I was more or less convinced by around page 75, and then though "oh my god I've got another 175 pages of this to read". The horse is dead, dude, give it up.

In the end, though, it was worth persevering on past that point, because in the process of explaining all the many ways in which mirror neurons are Not All That, we get to look at a lot of what IS known about how the brain works. Hickok obviously knows a lot about cognitive science, and does a good job of explaining it to the rest of us. Hopefully next time he writes a book, he will take on a topic that can put up more of a fight.

Teo 2050 says

~5.5h @ 2x. I regret listening to the monotonous audiobook version, and would recommend it only to someone with a less shallow background-knowledge of the topic (= all the hype related to mirror neurons + interest/XP in the actual cognition). The book's title is a bit misleading, as is better explained in other existing reviews (check also Amazon). What I liked most were the later thoughts&research on autism as well as the basic appendices that, as someone else pointed out, a novice like me should've started with. I'll likely return to parts of this book in written form re: mirror neurons some time in the future.

Contents:
(view spoiler)
