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## In the Minds of Others

### Reading fiction can strengthen your social ties and even change your personality

We recognize Robert Louis Stevenson's Long John Silver by his commanding presence, his stoicism and the absence of his left leg, cut off below the hip. Although we think we know the roguish Silver, characters such as he are not of this world, as Stevenson himself admitted in Longman's Magazine in 1884. He described fictional characters as being like circles -- abstractions. Scientists use circles to solve problems in physics, and writers and readers likewise use fictional characters to think about people in the social world.

Psychologists once scoffed at fiction as a way of understanding people because -- well -- it's made up. But in the past 25 years cognitive psychologists have developed a new appreciation for the significance of stories. Just as computer simulations have helped us understand perception, learning and thinking, stories are simulations of a kind that can help readers understand not just the characters in books but human character in general. In 1986 psychologist Jerome Bruner, now at New York University School of Law, argued persuasively that narrative is a distinctive and important mode of thought. It elaborates our conceptions of human or humanlike agents and explores how their intentions collide with reality.

Recent research shows that far from being a means to escape the social world, reading stories can actually improve your social skills by helping you better understand other human beings. The process of entering imagined worlds of fiction builds empathy and improves your ability to take another person's point of view. It can even change your personality. The seemingly solitary act of holing up with a book, then, is actually an exercise in human interaction. It can hone your social brain, so that when you put your book down you may be better prepared for camaraderie, collaboration, even love.

## Social Simulations

Long before computers were invented, stories functioned as the original virtual worlds. In 1594 William Shakespeare realized that a play essentially re-creates a social environment -- he used the term "dream." In *A Midsummer Night's Dream*, Shakespeare's characters live in an imagined land in which dripping the juice of "a little western flower" into a sleeper's eye makes the sleeper fall in love with the first person he or she sees upon waking. In this dream world, the flower juice enables the selection of a life partner. Professor of English Elaine Scarry of Harvard University also advances the dream theme in *Dreaming by the Book*. She argues that rather than simply doling out descriptions of a world, a successful fiction writer offers "instructions" to start up a kind of waking dream.

But immersion in fiction need not be perceived as an isolating activity. Several years ago Raymond A. Mar, then a graduate student in psychology at the University of Toronto, decided to challenge the popular conception that people who read a lot of fiction are socially withdrawn bookworms who use novels as an escape from reality. Drawing on the social simulation idea, which I had described in two publications in the 1990s, Mar wanted to know whether people who read a lot of fiction might actually have better social skills than those who read little or none. Just as pilots gain practice with flight simulators, he reasoned, people might acquire social experience by reading fiction.

Along with our Toronto colleagues, psychologists Jacob Hirsh, Jennifer de la Paz and Jordan Peterson, Mar and I assessed the reading habits of 94 adults, separating fiction from nonfiction. Then we tested the volunteers on two types of social skills: emotion perception and social cognition, for the former, we asked subjects to try to discern a person's emotional state from photographs of just the eyes [see box on opposite page]. For the latter, participants answered questions about video clips of individuals interacting -- for example, "which of the two children, or neither, in this clip belongs to the adult?" In this study, published in 2006, we found that the more fiction people read, the better they were at perceiving emotion in the eyes and, to a lesser extent, correctly interpreting social cues. These results drew the first strong connection between fiction reading and social skills, although we were not yet sure whether reading fiction was causing these individual differences or whether those differences existed in the first place.

A year later Mar published a piece of evidence more directly supporting the idea that reading fiction can improve social aptitude. Mar assigned 303 adults to read either a short story or an essay from the *New Yorker*. Then he gave all of them tests of both analytical and social reasoning. The former consisted of logic problems in verbal form; the latter asked people to draw conclusions from hypothetical social scenarios. Those who read the story performed better, on average, on the social reasoning test than those who read the nonfiction essay, suggesting that the fiction primed them to think about the social world. In contrast, the analytical reasoning scores were the same for both groups. I bet, even a brief bout of reading fiction can temporarily improve a person's social skills.

## A New Perspective

Good social skills require having a well-developed theory of mind. Sometimes called mind reading, theory of mind is the ability to take the perspectives of Other people, to make mental models of others, and to understand that someone else might have beliefs and intentions that are different from your own.

Children start an to acquire this ability at about four years old, when they can separate what someone else knows from what they know themselves. Theory of mind continues to develop throughout life. The ability to gauge emotion from pictures of just the eyes correlates with theory-of-mind skills, as does the capacity for empathy. Our 2006 study, with its test of eye expressions, suggests that the more fiction people read, the better they are at making mental models of others.

Still, the association we found between reading fiction and social ability could simply have reflected an affinity for fiction among people with good social skills. That is, devouring novels might be a result, not a cause, of having a strong theory of mind. To test this possibility, in 2009 we published a repeat of our earlier investigation with a separate group of 252 adults. This time, though, we measured the participants' so-called Big Five personality traits: extra-version, emotional stability, openness to experience, agreeableness and conscientiousness. We also assessed their social networks (social support), degree of social isolation and loneliness.

People who scored high on the personality trait of openness to experience did read slightly more fiction than those who scored higher on other traits. But when we controlled for this -- statistically subtracted out this tendency and the effects of other individual differences -- we still found a large and significant relation between the amount of fiction people read and their empathic and theory-of-mind abilities; it looked as if reading fiction improved social skills, not the other way round. Moreover, individuals who read predominantly fiction were not lonely. In fact, they were less socially isolated and had more social support than people who were largely nonfiction readers.

In 2010 Mar, along with psychologists Chris Moore of Dalhousie University in Halifax and Jennifer Tackett of the University of Toronto, followed up this work on adults with a Study of S5 preschool children. They found thatthe more fictional stories preschoolers listened to and the more fictional movies they saw, the better they were on five tests of children's theory of mind. In one such test, a child is shown a toy figure of an adult and a picture of a carrot and a cookie. The child is asked which kind of snack he or she prefers and is then told that the toy figure prefers the other snack. Then the child answers the theory-of-mind question: The toy figure wants a snack, so which snack will the figure choose? To be correct, children have to provide an answer that differs from their own desires.

Although scores on these tests were better among kids who listened to more stories or watched more movies, they were not higher among kids who watched a lot of television. The reason probably lies in the fact that TV shows explore fewer topics and themes that require adopting a character's point of view. They less often challenge the viewer to explain a protagonist's behavior, for example, or analyze the reasons for an outcome that a protagonist did not expect.

Our accumulating findings are providing increasing support for the hypothesis that reading fiction facilitates the development of social skills because it provides experience thinking about other people. That is, we think the defining characteristic of fiction is not that it is made up but that it is about human, or humanlike, beings and their intentions and interactions. Reading fiction trains people in this domain, just as reading nonfiction books about, say, genetics or history builds expertise in those subject areas.

To test this hypothesis more fully, we plan to assign people to read either only fiction or only nonfiction books for several months. We will measure the social awareness of both groups before and after the reading period. If our theory is correct, the fiction readers should show significant improvement on social measures, and their scores should increase more than those who were exposed to just nonfiction.

### Getting into Character

Fiction gets its power from a reader's emotional connection to the characters in a story -- in a word, empathy. Scientists have traced the roots of some aspects of that tie in the brain. In a 2004 study, for example, neuroscientist Tania Singer and her colleagues from University College London found, using functional MRI, that brain areas such as the anterior insula and anterior cingulate cortex become active both when we feel pain and when we know that someone we love is in pain. These areas seem involved in the emotional aspects of pain.

The emotional empathy that is critical to our day-to-day relationships also enables us to picture ourselves living as the characters do when we read fiction. In fact, recent brain scans reveal that we internalize what a character experiences by mirroring those feelings and actions ourselves. In a study published in 2009 psychologists Nicole Speer, Jeremy Reynolds, Khenia Swallow and Jeff Zacks of Washington University in St. Louis asked 28 volunteers to recline in an fMRI scanner and read a short story, presented one word at a time on a screen. When a subject read about something the protagonist did, the researchers found that the reader's brain responded as if he or she were performing the same action. When the words of a passage were about picking up or putting down an object -- for instance, "Raymond laid down his pencil" -- regions associated with grasping and letting go of an object with the hands were activated. These areas included the hand area of the premotor (motor planning) and of the somatosensory (body-sensing) cortices.

Other researchers have tried to home in on how fiction might tap into brain processes governing theory of mind. If narrative augments our ability to understand others, the brain regions concerned with following a storyline should overlap with those recruited in theory-of-mind tasks. To test this idea, earlier this year Mar, now at York University in Toronto, published a statistical review of 86 brain scanning studies in which participants either had to comprehend a story, perform a theory-of-mind task based on a narrative or carry out a theory-of-mind task that did not involve a story. By comparing the brain areas across the studies, Mar identified a large group of structures spanning disparate areas of the brain that all three tasks seemed to recruit. These regions, he concluded, make up a "core mentalizing network" that enables the understanding of others' mental events in life as well as in a story.

Such investigations support the idea that when we read fiction we put aside our own concerns and plans and adopt those of the story's protagonist. Doing so allows us to understand a story's events from the character's point of view. We do not actually experience the character's emotions -- after all, the character is an abstraction. Rather we feel our own emotions in response to the yearnings, actions and circumstances the writer describes. The trajectory of these emotions keeps us turning the pages or glued to the screen. [For more on the power of stories, see "The Secrets of Storytelling: Why We Love a Good Yarn," by Jeremy Hsu; SCIENTIFIC AMERICAN MIND, August/September 2008.]

## Changing Personality

The brain's emotional responses to good literature do more than forge a connection with a nonexistent personality -- they can even alter the reader's sense of self. In a 2009 study Peterson and I, along with Toronto psychologists Maja Djikic and Sara Zoeter-man, randomly assigned 166 people to read either the short story by Anton Chekhov entitled "The Lady with the Little Dog" or a version of it that Djikic rewrote in the style of a nonaction report. In the story, a banker named Gomov meets a young woman, Anna, at the Russian seaside resort of Yalta as she is walking her dog. The two begin an affair. After they go home to their spouses, to their surprise, the affair refuses to fade in their minds. Gomov and Anna meet from time to time and long to be united, but the story ends without resolution. Djikic's version, written as a report from a divorce court, contained exactly the same information and was the same length and level of reading difficulty. Readers judged it to be just as interesting as Chekhov's story, though not as artistic.

Before and after reading the texts, the participants took a personality test that measured the Big Five traits and rated the intensity with which they felt 10 different emotions -- sadness, anxiety, happiness, and so on. As compared with those who read the report, those who read the story underwent small but measurable personality changes. Participants changed in different ways: some became more or less open to experience, for example, whereas others were more or less agreeable after exposure to the story. The degree of personality change paralleled the amount of emotional change a participant experienced during reading. As with all good literature, Chekhov's story prompted people to think and feel in new ways, but the particular feelings and thoughts it evoked depended on the reader.

Only the story version seemed to enable readers to empathize with Gomov and Anna. The properties of fictional narrative invite identification with characters in ways that nonfiction usually does not. Great art, it seems, may prompt perturbations in the usually stable structure of personality. Although the personality changes we found were probably temporary, as people spend more time reading fiction they may become, say, more open and perceptive about others in general.

We may often think of stories as diversions. But how we engage with them involves the same mental processes that enable us to interact with others in daily life. Entering the simulated worlds of stories and engaging with the minds of their characters changes us. Because of their power over the mind, stories may be useful in the development of interpersonal skills and relationships among children and adolescents. And no matter your age, curling up comfortably with a novel in an armchair may do your mind -- and social life -- a bit of good.

For an interactive graphic highlighting psychologically rich novels, visit [www.ScientificAmerican.com/mind/nov2011/fiction](http://www.ScientificAmerican.com/mind/nov2011/fiction).

The solitary act of holing up with a book is actually an exercise in human interaction.

We internalize what a character experiences by mirroring those feelings and actions.

## FAST FACTS

### Bookworm Meets Socialite

Reading stories can fine-tune your social skills by helping you better understand other human beings.

Entering imagined worlds builds empathy and improves your ability to take another person's point of view.

A love affair with narrative may gradually alter your personality -- in some cases, making you more open to new experiences and more socially aware.

### (The Author)

KEITH **OATLEY** is professor emeritus of cognitive psychology at the University of Toronto and is a fellow of the Royal Society of Canada. His most recent novel is *Therefore Choose* (Goose Lane, 2010).

### Stories on the Mind

The brain responds to fiction as if a reader were feeling or acting just as the character is in the story. Scientists correlated passages displayed in a functional MRI scanner with brain activity. The prefrontal cortex, an area behind the forehead concerned with goal-setting, reacted when a character initiated a new goal. The temporal cortex, at the brain's sides, responded to character switches and goal-directed actions. Other parts reacted to allusions to time, or to changes in a character's spatial location or dealings with objects, in keeping with their regular roles.

### Character

As soon as Mrs. Logan made a check mark on his paper, Raymond hurried back to his desk.

### Goal

Raymond crumpled the paper, seemingly without any anxiety.

### Object

Raymond picked up his English workbook ...

### Space

... and returned to the teacher's desk.

### Multiple Aspects

Responds to various features of the storyline.

### Time

He walked briskly.

### (Further Reading)

\* Why Fiction May Be Twice as True as Fact: Fiction as Cognitive and Emotional Simulation. Keith **Oatley** in *Review of General Psychology*, Vol. 3, No. 2, pages 101-117; June 1999.

\* Exploring the Link between Reading Fiction and Empathy: Ruling out Individual Differences and Examining Outcomes. Raymond Mar, Keith **Oatley** and Jordan Peterson in *Communications: The European Journal of Communication Research*, Vol. 34, No. 4, pages 407-428; December 2009.

- \* On Being Moved by Art: How Reading Fiction Transforms the Self. Maja Djikic, Keith **Oatley**, Sara Zoeterman and Jordan Peterson in Creativity Research Journal, Vol. 21, No. 1, pages 24-29; 2009.
- \* The Neural Bases of Social Cognition and Story Comprehension. Raymond Mar in Annual Review of Psychology, Vol. 62, pages 103-134; 2011.
- \* Such Stuff as Dreams: The Psychology of Fiction. Keith **Oatley**. Wiley-Blackwell, 2011.
- \* The psychology of fiction: [www.onfiction.ca](http://www.onfiction.ca)

Although people usually read by themselves, fiction readers are not lonely. In fact, they tend to have more social support than do readers of nonfiction.

Anxious? Annoyed? A person's ability to correctly read an expression from a snapshot of just the eyes reflects his or her social skills. Fiction fans do well at this task. Test yourself here: [www.glenrowe.net/BaronCohen/Faces/EyesTest.aspx](http://www.glenrowe.net/BaronCohen/Faces/EyesTest.aspx)

Reading fiction builds a person's capacity for empathy and improves her ability to understand the mental states of others. A "core mentalizing network" in the brain enables the latter skill.

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By Keith **Oatley**

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