

The Secrets of STORYTE

Our love for telling tales reveals the workings of the mind

By Jeremy Hsu

To study storytelling, scientists must first define what constitutes a story, and that can prove tricky. Because there are so many diverse forms, scholars often define story structure, known as narrative, by explaining what it is not. Exposition contrasts with narrative by being a simple, straightforward explanation, such as a list of facts or an encyclopedia entry. Another standard approach defines narrative as a series of causally linked events that unfold over time. A third definition hinges on the typical narrative's subject matter: the interactions of intentional agents—characters with minds—who possess various motivations.

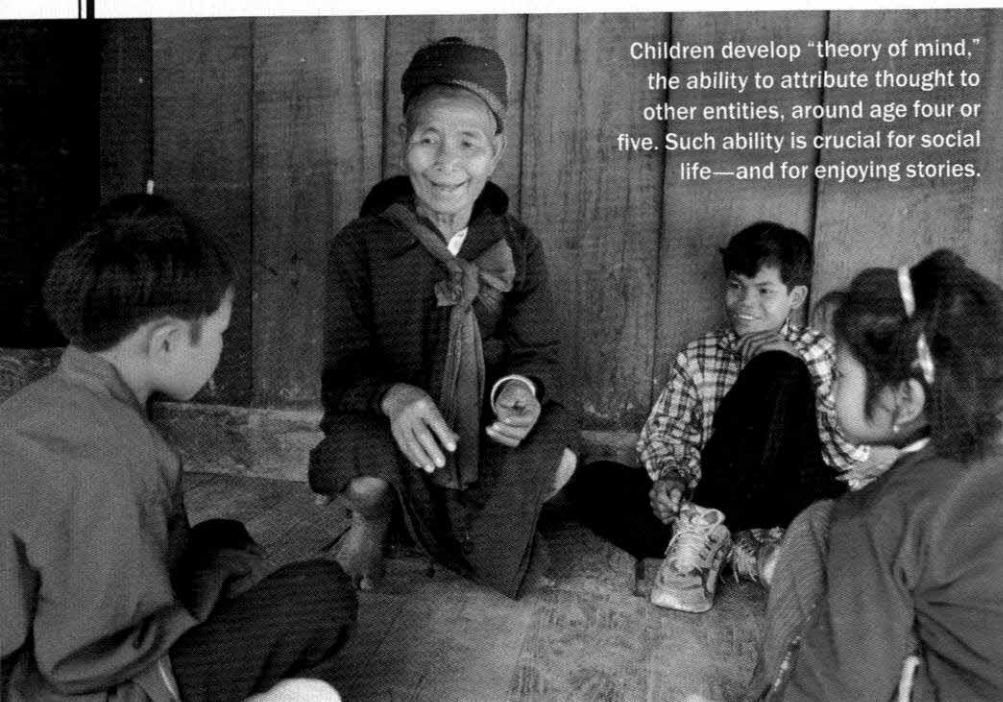
When Brad Pitt tells Eric Bana in the 2004 film *Troy* that “there are no pacts between lions and men,” he is not reciting a clever line from the pen of a Hollywood screenwriter. He is speaking Achilles’ words in English as Homer wrote them in Greek more than 2,000 years ago in the *Iliad*. The tale of the Trojan War has captivated generations of audiences while evolving from its origins as an oral epic to written versions and, finally, to several film adaptations. The power of this story to transcend time, language and culture is clear even today, evidenced by *Troy*’s robust success around the world.

Popular tales do far more than entertain, however. Psychologists and neuroscientists have recently become fascinated by the human predilection for storytelling. Why does our brain seem to be wired to enjoy stories? And how do the emotional and cognitive effects of a narrative influence our beliefs and real-world decisions?

The answers to these questions seem to be rooted in our history as a social animal. We tell stories about other people and for other people. Stories help us to keep tabs on what is happening in our communities. The safe, imaginary world of a story may be a kind of training ground, where we can practice interacting with others and learn the customs and rules of society. And stories have a unique power to persuade and motivate, because they appeal to our emotions and capacity for empathy.

A Good Yarn

Storytelling is one of the few human traits that are truly universal across culture and through all of known history. Anthropologists find evidence of folktales everywhere in ancient cultures, written in Sanskrit, Latin, Greek, Chinese, Egyptian and Sumerian. People in societies of all types weave narratives, from oral storytellers in hunter-gatherer tribes to the millions of writers churning out books, television shows and movies. And when a characteristic behavior shows up in so many different societies, researchers pay attention: its roots may tell us something about our evolutionary past.



Children develop "theory of mind," the ability to attribute thought to other entities, around age four or five. Such ability is crucial for social life—and for enjoying stories.

However narrative is defined, people know it when they feel it. Whether fiction or nonfiction, a narrative engages its audience through psychological realism—recognizable emotions and believable interactions among characters. "Everyone has a natural detector for psychological realism," says Raymond A. Mar, assistant professor of psychology at York University in Toronto. "We can tell when something rings false."

But the best stories—those retold through generations and translated into other languages—do more than simply present a believable picture. These tales captivate their audience, whose emotions can be inextricably tied to those of the story's characters. Such immersion is a state psychologists call "narrative transport."

Researchers have only begun teasing out the relations

FAST FACTS

Once upon a Time

1 >> Storytelling is a human universal, and common themes appear in tales throughout history and all over the world.

2 >> These characteristics of stories, and our natural affinity toward them, reveal clues about our evolutionary history and the roots of emotion and empathy in the mind.

3 >> By studying narrative's power to influence beliefs, researchers are discovering how we analyze information and accept new ideas.

among the variables that can initiate narrative transport. A 2004 study by psychologist Melanie C. Green, now at the University of North Carolina at Chapel Hill, showed that prior knowledge and life experience affected the immersive experience. Volunteers read a short story about a gay man attending his college fraternity's reunion. Those who had friends or family members who were homosexual reported higher transportation, and they also perceived the story events, settings and characters to be more realistic. Transportation was also deeper for participants with past experiences in fraternities

or sororities. "Familiarity helps, and a character to identify with helps," Green explains.

Other research by Green has found that people who perform better on tests of empathy, or the capacity to perceive another person's emotions, become more easily transported regardless of the story. "There seems to be a reasonable amount of variation, all the way up to people who can get swept away by a Hallmark commercial," Green says.

In Another's Shoes

Empathy is part of the larger ability humans have to put themselves in another person's shoes: we can attribute mental states—awareness, intent—to another entity. Theory of mind, as this trait is known, is crucial to social interaction and communal living—and to understanding stories.

Children develop theory of mind around age four or five. A 2007 study by psychologists Daniela O'Neill and Rebecca Shultis, both at the University of Waterloo in Ontario, found that five-year-olds could follow the thoughts of an imaginary character but that three-year-olds could not. The children saw model cows in both a barn and a field, and the researchers told them that a farmer sitting in the barn was thinking of milking the cow in the field. When then asked to point to the cow the farmer wanted to milk, three-year-olds pointed to the cow in the barn—they had a hard time following the character's thoughts to the cow in the field. Five-year-olds, however, pointed to the cow in the field, demonstrating theory of mind.

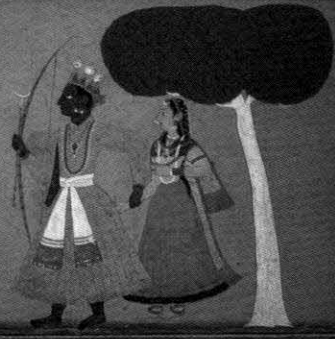
Perhaps because theory of mind is so vital to social living, once we possess it we tend to imagine minds everywhere, making stories out of everything. A classic 1944 study by Fritz Heider and Mary-Ann Simmel, then at Smith College, elegantly demonstrated this tendency. The psy-

The imaginary world of stories may serve as a proving ground for vital social skills.

chologists showed people an animation of a pair of triangles and a circle moving around a square and asked the participants what was happening. The subjects described the scene as if the shapes had intentions and motivations—for example, “The circle is chasing the triangles.” Many studies since then have confirmed the human predilection to make characters and narratives out of whatever we see in the world around us.

But what could be the evolutionary advantage of being so prone to fantasy? “One might have expected natural selection to have weeded out any inclination to engage in imaginary worlds rather than the real one,” writes Steven Pinker, a Harvard University evolutionary psychologist, in the April 2007 issue of *Philosophy and Literature*. Pinker goes on to argue against this claim, positing that stories are an important tool for learning and for developing relationships with others in one’s social group. And most scientists are starting to agree: stories have such a powerful and universal appeal that the neurological roots of both telling tales and enjoying them are probably tied to crucial parts of our social cognition.

The *Ramayana*'s strong male and beautiful female characters are common archetypes found in many disparate cultures.



As our ancestors evolved to live in groups, the hypothesis goes, they had to make sense of increasingly complex social relationships. Living in a community requires keeping tabs on who the group members are and what they are doing. What better way to spread such information than through storytelling?

Indeed, to this day people spend most of their conversations telling personal stories and gossiping. A 1997 study by anthropologist and evolutionary biologist Robin Dunbar, then at the University of Liverpool in England, found that social topics accounted for 65 percent of speaking time

among people in public places, regardless of age or gender.

Anthropologists note that storytelling could have also persisted in human culture because it promotes social cohesion among groups and serves as a valuable method to pass on knowledge to future generations. But some psychologists are starting to believe that stories have an important effect on individuals as well—the imaginary world may serve as a proving ground for vital social skills.

“If you’re training to be a pilot, you spend time in a flight simulator,” says Keith Oatley, a professor of applied cognitive psychology at the University of Toronto. Preliminary re-

search by Oatley and Mar suggests that stories may act as “flight simulators” for social life. A 2006 study hinted at a connection between the enjoyment of stories and better social abilities. The researchers used both self-report and assessment tests to determine social ability and empathy among 94 students, whom they also surveyed for name recognition of authors who wrote narrative fiction and non-narrative nonfiction. They found that students who had had more exposure to fiction tended to perform better on social ability and empathy tests. Although the results are provocative, the authors caution that the study did not probe cause and effect—exposure to stories may hone social skills as the researchers suspect, but perhaps socially inclined individuals simply seek out more narrative fiction.

In support for the idea that stories act as practice for real life are imaging studies that reveal similar brain activity during viewings of real people and animated characters. In 2007 Mar conducted a study using *Waking Life*, a 2001 film in which live footage of actors was traced so that the characters appear to be animated drawings. Mar used functional magnetic resonance imaging to scan volunteers’ brains as they watched matching footage of the real actors and the corresponding animated characters. During the real footage, brain activity spiked strongly in the superior temporal sulcus and the temporoparietal junction, areas associated with processing biological motion. The same areas lit up to a lesser extent for the animated footage. “This difference in brain activation could be how

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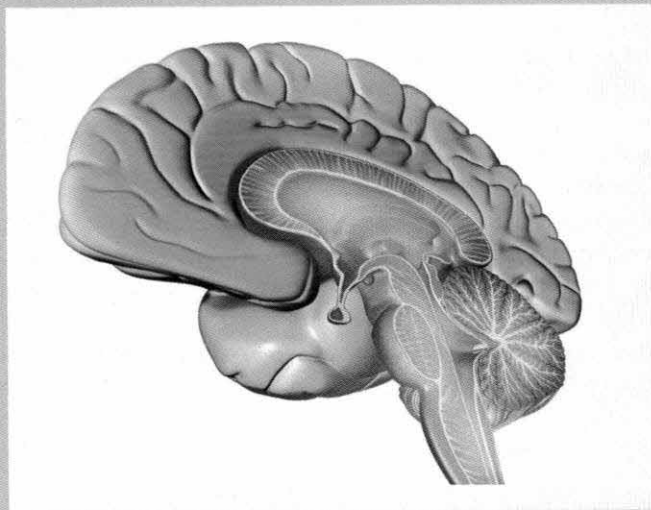
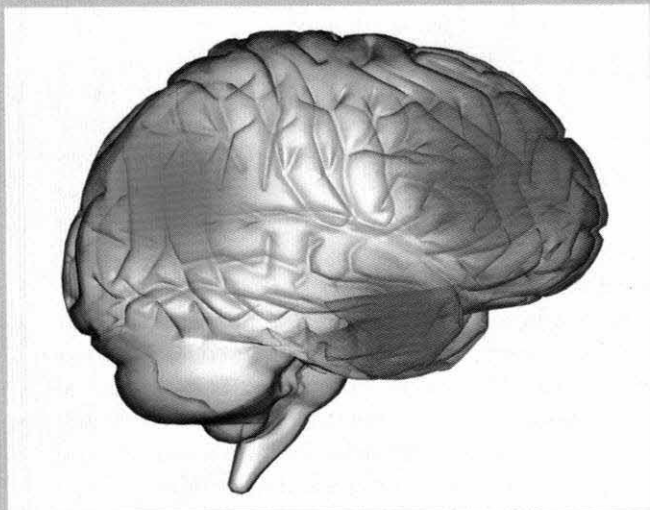
Tales in the Brain

Imaging studies have found much story-related activity in the brain's right hemisphere. Patterns for story processing differ from patterns for other related mental tasks, such as paying attention or stringing together sentences for language comprehension.

Raymond A. Mar, now at York University in Toronto, reviewed such imaging research in a 2004 paper. Areas that appear crucial to creating or understanding narrative include the medial (*pink*) and lateral (*green*) prefrontal cortex, home to working memory, which help to sequence information and represent story events. The cingulate cortex

(*orange*) may be involved in adding visuospatial imagery and connecting personal experience with the story to add understanding.

Brain regions such as the medial prefrontal cortex, temporoparietal junction (*red*) and temporal poles (*purple*) may also work together to aid in the identification of characters' mental states. The ability to read other people's motivations and intentions enables not only our understanding of stories but, more crucially, the comprehension of real-life social situations—an undeniable evolutionary advantage for both individuals and groups alike. —J.H.



we distinguish between fantasy and reality,” Mar says.

As psychologists probe our love of stories for clues about our evolutionary history, other researchers have begun examining the themes and character types that appear consistently in narratives from all cultures. Their work is revealing universal similarities that may reflect a shared, evolved human psyche.

Boy Meets Girl ...

A 2006 study by Jonathan Gottschall, an English professor at Washington & Jefferson College, found relevant depictions of romantic love in folktales scattered across space and time. The idea of romantic love has not been traditionally considered to be a cultural universal because of the many societies in which marriage is mainly an economic or utilitarian consideration. But Gottschall's study suggests that rather than being a construct of certain societies, romantic love must have roots in our common ancestry. In other words, romance—not just sex—has a biological basis in the brain.

“You do find these commonalities,” Gottschall says. He is one of several scholars, known informally as literary Darwinists, who assert that story themes do not simply spring

from each specific culture. Instead the literary Darwinists propose that stories from around the world have universal themes reflecting our common underlying biology.

Another of Gottschall's studies published earlier this year reveals a persistent mind-set regarding gender roles. His team did a content analysis of 90 folktale collections, each consisting of 50 to 100 stories, from societies running the gamut from industrial nations to hunter-gatherer tribes. They found overwhelmingly similar gender depictions emphasizing strong male protagonists and female beauty. To counterbalance the possibility that male storytellers were biasing gender idealizations, the team also sampled cultures that were more egalitarian and less patriarchal.

“We couldn't even find one culture that had more emphasis on male beauty,” Gottschall notes, explaining that the study sample had three times as many male as compared with female main characters and six times as many references to female beauty as to male beauty. That difference in gender stereotypes, he suggests, may reflect the classic Darwinian emphasis on reproductive health in women, signified by youth and beauty, and on the desirable male ability to provide for a family, signaled by physical power and success.

Other common narrative themes reveal our basic wants

People accept ideas more readily when their minds are in story mode as opposed to an analytical mind-set.

and needs. "Narrative involves agents pursuing some goal," says Patrick Colm Hogan, professor of English and comparative literature at the University of Connecticut. "The standard goals are partially a result of how our emotion systems are set up."

Hogan does not consider himself a literary Darwinist, but his research on everything from Hindu epic poems such as the *Ramayana* to modern film adaptations of Shakespeare supports the idea that stories reveal something about human emotions seated in the mind. As many as two thirds of the most respected stories in narrative traditions seem to be variations on three narrative patterns, or prototypes, according to Hogan. The two more common prototypes are romantic and heroic scenarios—the former focuses on the trials and travails of love, whereas

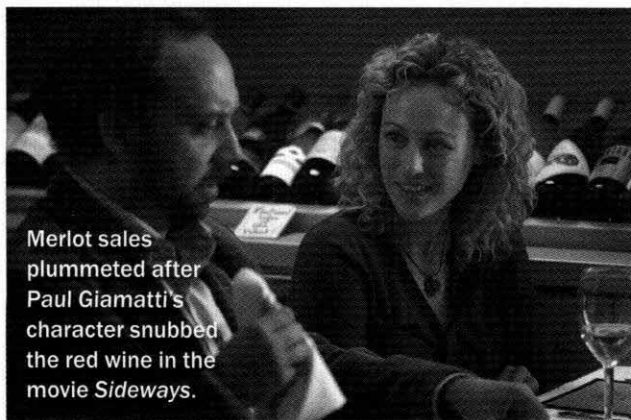
ads that encouraged viewers to think about the arguments for a product. Similarly, Green co-authored a 2006 study that showed that labeling information as "fact" increased critical analysis, whereas labeling information as "fiction" had the opposite effect. Studies such as these suggest people accept ideas more readily when their minds are in story mode as opposed to when they are in an analytical mind-set.

Works of fiction may even have unexpected real-world effects on people's choices. Merlot was one of the most popular red wines among Americans until the 2005 film *Sideways*

depicted actor Paul Giamatti as an ornery wine lover who snubbed it as a common, inferior wine. Winemakers saw a noticeable drop in sales of the red wine that year, particularly after *Sideways* garnered national attention through several Oscar nominations.

As researchers continue to investigate storytelling's power and pervasiveness, they are also looking for ways to harness that power. Some such as Green are studying how stories can have applications in promoting positive health messages. "A lot of problems are behaviorally based," Green says, pointing to research documenting the influence of Hollywood films on smoking habits among teens. And Mar and Oatley want to further examine how stories can enhance social skills by acting as simulators for the brain, which may turn the idea of the socially crippled bookworm on its head.

One thing is clear—although research on stories has only just begun, it has already turned up a wealth of information about the social roots of the human mind—and, in science, that's a happy ending. **M**



Merlot sales plummeted after Paul Giamatti's character snubbed the red wine in the movie *Sideways*.

the latter deals with power struggles. The third prototype, dubbed "sacrificial" by Hogan, focuses on agrarian plenty versus famine as well as on societal redemption. These themes appear over and over again as humans create narrative records of their most basic needs: food, reproduction and social status.

Happily Ever After

The power of stories does not stop with their ability to reveal the workings of our minds. Narrative is also a potent persuasive tool, according to Hogan and other researchers, and it has the ability to shape beliefs and change minds.

Advertisers have long taken advantage of narrative persuasiveness by sprinkling likable characters or funny stories into their commercials. A 2007 study by marketing researcher Jennifer Edson Escalas of Vanderbilt University found that a test audience responded more positively to advertisements in narrative form as compared with straightforward

(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.
- ◆ **The Mind and Its Stories: Narrative Universals and Human Emotion.** Patrick Colm Hogan. Cambridge University Press, 2003.
- ◆ **Transportation into Narrative Worlds: The Role of Prior Knowledge and Perceived Realism.** Melanie C. Green in *Discourse Processes*, Vol. 38, No. 2, pages 247–266; 2004.
- ◆ **The Literary Animal: Evolution and the Nature of Narrative.** Edited by Jonathan Gottschall and David Sloan Wilson. Northwestern University Press, 2005.
- ◆ **Detecting Agency from the Biological Motion of Veridical vs Animated Agents.** R. A. Mar, W. M. Kelley, T. F. Heatherton and C. N. Macrae in *Social Cognitive and Affective Neuroscience*, Vol. 2, No. 3, pages 199–205; September 2007.