

## Narratology and Cognitive Science: A Problematic Relation

At first sight my title may seem sacrilegious, or at least totally ignorant of recent trends. Isn't cognition—that is, the mind—one of the hottest and fastest-developing areas of scientific inquiry? Isn't narrative widely recognized as an activity—or as an artifact, if you prefer—that puts into play cognitive mechanism of the highest importance, a way to give meaning to our being-in-the-world, to our interpersonal relations, and to the temporality of our existence? Isn't a scientific, and more particularly a “cognitivist” approach “the next big thing” in the beleaguered field of literature, as an article in the *New York Times* tells us (Cohen)?

But despite this widespread interest for what narrative means for the life of the mind, the concrete contributions of the cognitive sciences to narratology are far from enjoying the same consensus. To demonstrate the problematic nature of the relations between these two fields, I would like to focus on an article published by the service of public relations of Washington University in Saint Louis in February 2009. A journalist, Gerry Everding, wrote the article and its purpose is to publicize the research of the faculty of Washington University. It is titled “Readers build vivid mental simulations of narrative situations, brain scans suggest.”

Here are some of the most striking claims of the article:

A new brain-imaging study is shedding light on what it means to “get lost” in a good book suggesting that readers create vivid mental simulations of the sounds, sights, tastes and movements described in a textual narrative while simultaneously activating brain regions used to process similar experiences in real life.

“Psychologists and neuroscientists are increasingly coming to the conclusion that when we read a story and really understand it, we create a mental simulation of the events described by the story,” said Jeffrey M. Zacks, Ph.D., associate professor of psychology in Arts & Sciences and of radiology in the School of Medicine, director of the Dynamic Cognition Laboratory in the Department of Psychology and a co-author of the study.

Nicole Speer, Ph.D., lead author of the study, said findings demonstrate that reading is by no means a passive exercise. Rather, readers mentally simulate each new situation encountered in a narrative. Details about actions and sensations are captured from the text and integrated with personal knowledge from past experiences. These data are then run

through mental simulations using brain regions that closely mirror those involved when people perform, imagine or observe similar real-world activities.

This is what was found: Changes in the objects a character interacted with (e.g., "pulled a light cord") were associated with increases in a region in the frontal lobes known to be important for controlling grasping motions.

Changes in characters' locations (e.g., "went through the front door into the kitchen") were associated with increases in regions in the temporal lobes that are selectively activated when people view pictures of spatial scenes (Everding).

My first reaction when I read this article was the kind of satisfaction that people (especially mothers) express through the phrase "I told you so." I have dealt with the phenomenon of immersion in my book *Narrative as Virtual Reality*, and, to describe and explain this phenomenon of immersion, I borrowed from cognitive psychology the concept of mental simulation (Oatley). This notion of mental simulation can be associated with another concept, proposed by the psychologist Rolf Zwaan, namely the concept of situation model. It refers to the idea that the readers or spectators of narrative build a mental model of the narrative world, and constantly update this model to take into account the changes described by the text, but without losing sight of the preceding states of this world. To put this more concisely, to process a story is to build a history of the world in which it takes place. At first sight, the experiment described in the article brings a scientific verification of the phenomenon of narrative modeling. The MRI<sup>1</sup> images of Zacks and Speer prove that mental simulation actually takes place! Hurrah!

At second thought, however, my enthusiasm was considerably dampened. How do Zacks and Speer (or rather the journalist who publicized their research) know that readers construct *vivid* mental simulations, and not simply dim ones? How can one measure the amount of information contemplated by the inner eye of the imagination? According to the testimonies of readers collected by the psychologist Victor Nell, the degree of resolution of mental representations varies greatly with the temperament and the interest of the reader: some people will build a vivid image of the face of Emma Bovary, while others will only imagine a ghostly body moving through a landscape. And on what basis does the article claim that readers simulate *taste* as well as sight, sound, and movement? As G. Gabrielle Starr argues, imagining olfactory and gustatory sensations is much more problematic than imagining sounds, sights, and movement: it could very well be the case that rather than simulating (i.e. imaginatively perceiving) them, we process references to taste and smell semantically—that is, on the basis of meaning and associations (285).

When I read the scientific paper which forms the source of the article (Speer *et al.*), I was struck by the differences in the language and claims of the authors.

Instead of talking about "vivid mental simulation," Speer and her colleagues describe two results in much more sober language:

Reading about an event stimulates the same regions of the brain as the direct experience of this event. Neurological science is able to create a rudimentary map of the brain; for instance we know that spatial experience is localized in a certain region, and the experience of manipulating an object in another. The experiments conducted by the authors tell us that the same regions are stimulated when we read that the hero of a story moves around a house or grabs an object, and when we perform the same activities. Experiments conducted by other researchers with people reading isolated words, or with chimpanzees observing and then mimicking a behavior, had already provided such results; what allows Speer and her colleagues to interpret their findings as evidence of mental simulation is that they are the first to test their subjects on a coherent story. (They used a very simple children's story, and presented it a single word at a time to the subjects, in order to record their brain states at specific moments.) This use of a narrative *text* rather than isolated words leads to the second conclusion:

When the subjects read isolated words their brain produces different signals than when they read these sentences as a story. Furthermore, certain regions of the brain are activated only when the state of the narrative world undergoes multiple changes between sentences. This suggests that modelization requires a more intense effort.

But aren't these ideas self-evident for a narratologist? Do we need an MRI to tell us that reading isolated words does not require the same mental activity as reading a story? Are brain scans necessary to make us realize that there is something in common between apprehending an image of something—be it a verbal or visual representation—and apprehending its referent? Compare for instance the experience of being attacked by a mean dog versus the experience of reading a story about such an attack. If there wasn't some kind of brain activity common to both experiences, how could the reader establish a relation between them? How could he use his life experience and personal memories to fill in the blanks in the story? In a story titled "Funes the Memorious," Jorge Luis Borges describes what would happen if the idea of "dog" did not activate a common pattern of neurons for all of its manifestations: we would have separate mental images for yellow dogs and for mean dogs, for dogs at four o'clock in the afternoon and dogs made of terra cotta, not to mention for Chihuahuas and for rottweilers. We would consequently be unable to relate them to a common idea.

Instead of opening new perspectives on narrative cognition, the experiments of Zacks and Speer confirm what common sense tells us. The importance of scientific experiments is traditionally considered to be inversely proportional to the predictability of the results. But current techniques of brain imaging have not yet reached the necessary precision to tell narratologists something truly new and interesting concerning the cognitive foundations of narrative. In fact, it would have been more interesting if the MRI had denied any relations between reading about a situation and experiencing it directly.

Another attempt to test through MRI a type of brain activity relevant to narrative comprehension was conducted by Anna Abraham and her colleagues at the Max Planck institute in Leipzig. In this experiment, subjects were asked to imagine scenarios comprising real and imaginary characters (for instance; meeting George Bush vs. meeting Cinderella), and an MRI of their brain was taken in each case. It turned out that different regions of the brain were activated for real and fictional characters: for Cinderella, a region that corresponds to established facts; for George Bush, a region more open to revision. This difference may appear, at first sight, surprising, but it confirms what theorists of fiction tell us (Doležel; Ryan). Since fictional characters are created by texts, they are the product of a limited corpus of information. With real-life characters, on the other hand, the corpus is open-ended, since it is always possible that new information will turn up, and that it will lead to a revision of our image. George Bush may be counting on that! <sup>2</sup> Moreover, we know perfectly well that we will never run into Cinderella, but we can imagine circumstances that will lead to a meeting with George Bush: this also could explain why Cinderella is associated with established facts. I find Abraham's results more interesting than Zacks and Speer's, because they suggest something that is not self-evident: namely, that "truths" about the real world are more problematic than "fictional truths" — in other words, that we can trust the facts asserted by a novel about a fictional world better than the facts asserted by historians about the actual world. But do we need an MRI to know that fictional and real characters are ontologically different? From a narratological point of view, MRI studies are in a no-win situation: if they contradict narratological theory, they are useless, but, if they confirm it too fully, they are redundant.

There are at least two reasons why "hard" cognitive science—the kind that uses elaborate technology—cannot really trace what happens in the mind as we create or decode narratives. The first reason is the complexity of the network of the mind. The human brain contains one hundred billions of neurons, each linked to other neurons by more than ten thousand different synaptic connections. An MRI image

is currently unable to give an exact image of the brain neuron by neuron; all it can do is indicate which regions of the brain produce electric activity under various stimuli. MRI may be able to detect that reading the word "dog" and watching a dog both activate a region of the brain specialized in visualization, but it cannot (yet) identify a configuration of active neurons that mean "dog" to the mind of a certain subject. If imaging techniques ever become able to do so—and there is evidence that they are getting closer<sup>3</sup> — they will be reading thoughts, a rather scary prospect.

The second, and in my view more serious, limitation of the "hard" scientific approach has to do with what is known to philosophers as the mind-body problem—the problem of explaining how consciousness, a spiritual phenomenon, can emerge from the brain, an organ made of purely physical matter. The dominant theory in philosophy of mind and cognitive science is the rejection of explanations that postulate a dualism of mind and body, and the endorsement of a materialist position that views the mind as the result of electric activity within the brain. This activity produces distinct brain states—that is, different configurations of neurons with positive and negative charge. But the materialist position has been as unable as the dualist position to solve the mind-body problem. While the dualist position cannot explain how mental phenomena, such as intention, can cause physical events, such as firing a gun, the materialist position cannot explain how consciousness emerges from certain brain states and how these brain states can produce ideas. As Douglas Hofstadter has argued, there is still an unbridged gap between the level of neurons and the level of symbols. (Cognitive science is, in this regard, similar to physics, since physics has so far been unable to produce a "theory of everything" valid for both elementary particles and large material objects.) The distinction between the level of neurons and the level of symbols explains why MRI is of limited usefulness for the study of the cognitive activity associated with narrative: for narrative, like any mode of signification, involves a cognitive level whose basic elements are symbols and not neurons.

It is certainly not my intent to deny scientific value to investigations such as those of Zacks and Speer or Abraham, nor to discourage this kind of research; it plays an important role in the mapping of the brain, a project of central importance for the understanding of the working of the mind. My point is rather to ask what this kind of work means to narratology, at least in the current state of development of brain imagery. In other words, what profit can I draw, as a narratologist, from this kind of research? Am I going to pursue with greater enthusiasm the study of the phenomenon of narrative immersion, now that an MRI tells me that mental simulation actually exists? Will my interest in the ontological status of fictional

characters, in why we need fictions, receive a boost from learning that the brain is able to distinguish George Bush from Cinderella? Or will I consider the questions a closed matter, now that science has sanctioned a particular answer? This dilemma underscores the vast problem of the relations between speculative disciplines, such as philosophy and narratology, and experimental ones, such as neuroscience and cognitive psychology. What does it take for speculative and experimental disciplines to learn from each other? Under what conditions is interdisciplinary cooperation possible — in narratology as well as in other matters?

But cognitive science is not limited to experiments with MRI. The term "cognitive science" is an umbrella term which covers a variety of approaches coming from various disciplines: neurology, artificial intelligence, various kinds of psychology — evolutionary, social and cognitive — linguistics, and philosophy of mind. These approaches to cognition differ from each other through the relative importance of experimentation and speculation: neurological research represents the experimental pole, and philosophy of mind the speculative pole. (This does not mean that speculation is absent from the more experimental disciplines; the interpretation of results is always speculative, but at least the experimental disciplines generate their own data.)

Cognitive narratologists such as Richard Gerrig and David Herman have bemoaned the fact that, in the area of cognitive narratology, all influence has been in one direction, from the cognitive sciences to narratology, rather than the other way round. Is this situation inevitable, or is it due to the lack of maturity of cognitive narratology? This question reflects on the problematic nature of cognitive narratology, a project uncomfortably sandwiched between the speculative and interpretive disciplines of the humanities and the experimental disciplines of the hard sciences.

If we draw an axis that leads from interpretation to experimental verification, the extreme left is occupied by literary criticism, a discipline which has been traditionally concerned with the meaning and aesthetic quality of individual texts. A pure literary critic is a super-reader, a virtuoso of interpretation who regards the literary texts as an encrypted message that needs to be decoded through a display of style, erudition, and perspicacity, much in the way a score needs to be turned into music through performer's skills. For the literary critic to be successful, she must reveal meanings that nobody has thought of before. In the postmodern age, the purpose of literary criticism is not to produce objective knowledge about texts, but rather to play with them in a creative way.

To the right of literary criticism is classical narratology. (I take cognitive narratology to be post-classical.) Here the focus is not on interpretation but on description, comparison, and classification. Narratology is not concerned with individuating features, but rather with features that could appear in a number of different texts. For instance, narratologists will not be interested in the second-person narration of Michel Butor's *La Modification* as an expression of subjectivity, but as a narrative possibility that fills a spot in a paradigm — the paradigm of first-, second-, and third-person narration. In fact it does not really matter whether an author has used a specific device or not: as long as it is possible, it is narratologically significant. While the classical phase of narratology was mostly concerned with literary fiction, and differed from literary criticism only through its concern for the general rather than the particular, in its postclassical phase narratology increases the gap with literary criticism through its emphasis on story as a type of meaning that can be conveyed through a variety of different media.

Leaving a blank for cognitive narratology, let's move further to the right with experimental psychology—the kind that was pioneered by researchers such as Walter Kintsch, David Rummelhard, Jean Mandler, and Nancy Johnson, and was later practiced by Richard Gerrig, Nancy Stein, and Tony Trabasso, to name only a few. Experimental psychology shares one feature with literary criticism: both projects are concerned with interpretation. But the analogy stops here, for, while literary criticism tries to develop highly individualistic, sophisticated readings, experimental psychology focuses on the most automatic of mental operations, on operations which every reader performs unconsciously. These operations are often indistinguishable from the processing of language (Gerrig and Egidi). For instance, experimental psychology will ask: how do readers identify the referents of pronouns, what component of narrative (between, say, setting, complicating action, and resolution) is most easily remembered, to what extent do people keep in mind the goals of characters when the text narrates events that interrupt the pursuit of these goals — in other words, how do readers connect recently acquired information to information stored in long-term memory? Both literary criticism and classical narratology consider these operations too banal, too automatic, to be worthy of attention. Another crucial difference between the disciplines on the left and on the right lies in their foci of interest. The concern of psychological approaches to narrative is not the individual narrative text, nor the class of all narratives, but the nature of understanding. In other words, its concern is the mind. This is why psychologists have no qualms about using artificial texts specially made to test their hypotheses, rather than texts worth reading for their own sake.<sup>4</sup>

Now if the approaches to the left are concerned with texts and the approaches to the right are concerned with the mind in itself, is there something left in the middle for cognitive narratology to investigate? Cognitive narratology is an interdisciplinary bricolage that borrows ideas from the right and the left, combining freely the bottom-up approach typical of narratology—an approach that designs its own analytical tools—with a top-down application of concepts adopted from the hard cognitive sciences. But this borrowing from the right side does not go as far as adopting the rigors of experimentation: the kind of work that passes as cognitive narratology remains in spirit strictly speculative, and some narratologists interested in questions of cognition claim to be totally bored with experimental approaches. Furthermore, unlike the hard versions of cognitive science, cognitive narratology does not want to sacrifice an interest in texts, even though it often treats them as “tutor texts,” that is, as an instrument for the demonstration of ideas borrowed from the right side.

David Herman has come up with a felicitous expression to define the specific object of cognitive narratology: he calls it “the nexus of narrative and mind” (PAGES!). But it is one thing to have a term to differentiate the purpose of cognitive narratology from the concern of the neighboring disciplines, and quite another thing to link this term to a methodology. The nexus of narrative and mind can be studied in three areas:

1. The minds of characters.
2. The mental activity of the reader (spectator, player, etc).
3. Narrative as a way of thinking. (This question can be broadened into: the importance of narrative for the life of the mind.)

### 1. The Minds of Characters

The study of the minds of characters has not awaited the cognitive turn in narratology to form a central focus of investigation. Traditional literary criticism, especially under the influence of psychoanalysis, is interested in the mind as a secluded inner domain in which secret and often subconscious processes take place, such as dreams, desires, obsessions, and illusions. Classical narratology added to these thematic interests a catalog of the narrative techniques through which the mind can be represented in its interiority and secrecy: stream of consciousness, psychonarration, direct and indirect discourse, and their hybrid, free indirect discourse. The important work of Dorrit Cohn or Ann Banfield on the modes of representation of what is traditionally referred to as “inner life” conceives the omniscient narrator as a kind of MRI machine that reads the mind on the level of symbols and images, and not

simply on the level of neurons. This approach is very successful in describing the private dimension of the mind, but, as Alan Palmer has observed, it misses its public and open manifestations, as well as its interpersonal dimensions. Narrative is a form of representation focused on human action, and it is through their actions, much more than through the description of their inner thoughts or emotions, that characters reveal their state of mind. To understand human action, and, consequently, to understand a plot, it is necessary to construct the mental states that motivate agents. These mental states consist of desires, goals, beliefs, and plans.

Successful narratives keep the motivations and beliefs that explain the behavior of characters largely implicit, but in this text, which was created by Talespin, a computer program written in the late seventies by James Meehan, they are spelled out in all their details. If the program omitted a single inference, it would produce nonsense stories:

Once upon a time John Bear lived in a cave. John Bear knew that John was in his cave. One day John was very hungry. John wanted to get some honey. John wanted to find out where there was some honey. John liked Arthur Bird. John wanted Arthur to tell John where there was some honey. John was honest with Arthur. John wasn't competitive with Arthur. John thought that Arthur liked him. John thought that Arthur was honest with him. John wanted to ask Arthur whether Arthur would tell John where there was some honey.

(200)

A literary critic would probably say that this text takes the reader for an idiot. And, indeed, it is not the standard output of Talespin. For every story that Talespin generates, it produces a “normal” and a “verbose” mode. This is the verbose mode. It is a kind of cognitive scaffolding that makes explicit the layer of “what goes without saying” that underlies the behavior of characters. This layer must be reconstructed not only by the reader, but also by the characters who interact with John Bear.

An important part of this reasoning is beliefs formed about the beliefs of other characters: here, John Bear assumes that Arthur Bird is well disposed toward him. Forming such beliefs about other people's beliefs is indispensable to successful cooperation: if John Bear is wrong, which means if Arthur Bird is not well disposed toward him, the whole plan of getting honey will fall through. In tales of cooperation, characters accurately interpret on another's minds; in tales of deceit or of misunderstanding, they form wrong representations. This process of explaining the actions of people by inferring their mental states is not specific to the understanding of narrative; it is, rather, a fundamental mode of operation of the human mind, which applies in our interactions with both real people and fictional characters. It is known in cognitive science as “Folk Psychology” or “Theory of

Mind.” (For some researchers, e.g. Daniel Hutto, these two labels carry different theoretical implications, but, for my purpose, they can be considered synonymous.)

Anybody interested in the mechanism of plot, especially in the kind of mechanisms one finds in fables, fairy tales, or comedies of errors, is aware of these mirroring effects. But the influence of cognitive science has led to an accrued interest in these phenomena, and even to a theory that explains our interest in fiction. I am thinking here of the book of Lisa Zunshine, *Why We Read Fiction*. According to Zunshine, the answer to this question is the voyeuristic curiosity we have for the content of other people’s thoughts. Insofar as narrative plots are built on how characters construct each other’s goals, beliefs, and plans, these plots satisfy this craving we supposedly have for exercising our mind-reading activities. It remains to be seen whether mental voyeurism explains the appeal of any kind of plot, or whether it works better for psychological novels, such as *Pride and Prejudice*, than for fantasy, science fiction or adventure tales, such as *Lord of the Rings*. But it is undeniable that without the ability to construct representations of other people’s minds we would be unable to understand, and much less to appreciate stories.

The study of the mirroring effects between the minds of characters dovetails with my next topic—the cognitive processing of narrative messages—because it is the same mechanisms that allows people in real life to construct the mind of other people and interpreters of narratives to understand the motivations of characters. It has been claimed, notably by Lisa Zunshine (*Why We Read*) and David Herman (“Regrounding”) that narrative teaches us to perform more complicated mind-reading operations—by this I mean operations that reach a deeper level of intentionality—than those we perform in real life. According to this position, reading stories represents a mental gymnastics that enhances our brainpower. Without denying the value of narrative as learning experience, I would like to challenge this particular view.

As humans, we are very comfortable with computing three levels of mental states: “He knows that I know that he knows.” In some rare situations, we even need to compute four, but we must stretch our minds to do so. Can narrative really increase this limit? Zunshine claims that a certain passage in Virginia Woolf requires six levels, but Brian Boyd (“Fiction”) has seriously challenged her interpretation. I have tried mapping it myself and could see no more than three or four—after that, the levels become so entangled that they are impossible to relate to a specific character’s mind, and I am left with a sense of chaos that certainly does not enhance my Theory of Mind abilities. There must be a reason why biology has endowed us with minds that easily compute three levels: this is the depth required for deception. For instance, in the fable of “The Fox and the Crow,” the Fox wants (level 1) the

Crow to believe (level 2) that the Fox wants (level 3) to hear him sing. Our capability of computing three levels helps us not only to plan, but also to avoid deception. It can be stretched one level further, in cases of double deception: somebody wants to trick somebody else, but the prospective victim correctly identifies the deceiver’s intent, and pretends to fall in the trap, in order to deceive the deceiver. An example is a story about a fox and a rooster (Bruce; Ryan): the rooster invites the fox for breakfast, intending to eat him. The rooster pretends to believe that the fox is well disposed toward him, and asks him if he can bring a friend. The fox, hoping to get two roosters for breakfast, says yes, but, when the rooster arrives at the fox’s house, a dog that quickly chases the fox away accompanies him. The reasoning of the rooster can be mapped in this way: the rooster wants (1) the fox to believe (2) that the rooster believes (3) that the fox wants (4) to have breakfast with him (rather than make breakfast out of him). As this example demonstrates, narrative presents occasional examples of level 4 situations, but I seriously doubt that stories can train the mind to compute additional levels of intentionality, because going beyond level 4 has no practical usefulness. So, why would the characters in a story engage in this kind of reasoning? It is, of course, always possible to include in a story endlessly recursive sentences, such as “I want you to ask Mary to tell John to help Paul to convince Alice to marry Jason,” but this will be processed as a joke, which means, as a meaningless string of words, and not as a plot-relevant situation that needs to be mentally modeled by the reader.<sup>5</sup>

## 2. The Mental Activity of the Reader

The broader issue of the reader’s interpretive activity has been explored from both the literary left and the scientific right of cognitive narratology. The approach from the left is reader-response criticism, a school pioneered by Wolfgang Iser and inspired by Roman Ingarden’s philosophical work on the phenomenology of reading. Reader-response criticism originally focused on the reactions of a “model reader” or “standard reader” to complex literary texts, but its main drawback was a tendency to substitute the critic for the model reader and to end up as an impressionistic recording of the critic’s own experience. The movement quickly fell into the mold of virtuoso critical performance, and became far more interested in building a highly speculative and general theory of the meaning of literature than in studying the concrete operations that underlie the construction of literary meaning. The takeover of literary studies by cultural studies that took place in the nineties, and the increased interest in the historical and social context of literature, shattered the “model reader” into multiple subspecies—such as the “woman reader” or the

“Western reader” or the “middle-class white male queer or straight reader” — and it put so much emphasis on what separates these readers, at the expense of what they do in common, that reader response criticism, as a general phenomenology of reading, fell into obsolescence. This does not mean that the study of reader responses is dead; rather, it has been taken over by the scientific disciplines.

The approaches from the right are psychological experiments that rely on the experience of readers other than the investigator. There are basically three ways to measure the mental activity associated with narrative. The first, and most objective, is the one I have described at the beginning of my presentation: it consists of using imaging technology, such as MRI, to record automatically the electric signals emitted by the brain during the processing of narrative texts. But, in order to associate MRI images with specific passages in the narrative text, it is necessary to control the temporal flow of reading by presenting the text word by word on a screen. This creates a mode of reading so unnatural that it seriously limits the experiment's ability to capture the brain activity generated by narrative.

The second method consists of creating experiments which test the understanding and the memorizing of texts by asking people to perform certain tasks, such as pressing a button when they sense that a certain event has taken place. Most of these experiments use stories composed specifically to test a precise reaction — stories which nobody would read for their narrative interest. For instance, in an experiment aimed at measuring the time of reaction needed to process consistent and inconsistent texts, subjects were offered this text in several variations:

Today, Mary was meeting a friend for lunch. She arrived early at the restaurant and decided to get a table. After she sat down, she looked at the menu.

(a) This was Mary's favorite restaurant because it had fantastic junk food. Mary enjoyed eating anything that was quick and easy to fix. In fact, she ate at McDonald's at least three times a week. Mary never worried about her diet and saw no reason to eat nutritious food.

(b) This was Mary's favorite restaurant because it had fantastic health food. Mary, a health nut, had been a strict vegetarian for ten years. Her favorite food was cauliflower. Mary was so serious about her diet that she refused to eat anything that was fried or cooked in grease.

(c) . . . Mary ordered a cheeseburger and fries.

(O'Brien et al., qtd. in Gerrig and Egidi 50)

The third method is the least rigorous, but probably the one from which cognitive narratology has the most to learn. It consists of asking readers to describe, in their own words, their experience of a story. It has been used very productively by Victor Nell in *Lost in a Book*, his magisterial study of the experience of immersion. Of the three methods, this one is the best qualified to capture what Roland Barthes called “the pleasure of the text,” because it makes it possible to study the personal

reactions of real people to complex literary texts — the kind of texts one chooses to read for their narrative merit.

Cognitive narratologists want to be more rigorous than reader-response critics, but they share the reluctance of literary criticism for an experimental approach. They like to rely on their own close reading of the text, rather than in using data collected from other readers, because by working in this way they can use the text to demonstrate general ideas about the mind. In contrast to the practitioners of experimental approaches, they are less interested in the nuts and bolts of the understanding process than in a higher level of meaning that includes aesthetic appreciation, emotional involvement, symbolic dimension, and existential importance. These are not the type of questions that can be answered through experimentation: their solutions, always partial and temporary, can only come from a reflection arising from a personal encounter with narrative texts. This leads us back to the reliance of reader-response critics on their own intuition; the main difference is that today's cognitive narratologists are better informed of cognitive science.

### 3. Narrative as a Mode of Thinking

“Narrative as a mode of thinking” shifts the focus of attention from the mind that decodes the story to the mind that conceives it. This mind can be the mind of the author, if there is a text and an overt act of communication, but, for many researchers, a story can be a representation that never leaves the mind of the subject. This is particularly the case for those psychologists who conceive of the self as a narrative construct, for having a self is not the exclusive privilege of those who write autobiographies.

The focus on narrative as a mode of thinking covers not only the activity of telling stories to oneself or to others, but it also directs attention to the importance of narrative communication for the development of the human mind and for the creation of social relations. This leads to the even broader question of how mankind's storytelling abilities contribute to the survival of the species. We touch here on the evolutionary approaches to art, narrative, and literature that have been so popular in the Darwin bicentennial year of 2009 (Brian Boyd, Dennis Dutton, Joseph Carroll).

In contrast to studies of the mental activity of the reader, approaches to narrative as a mode of thinking have been almost entirely speculative. This is most acutely the case with evolutionary approaches: since we do not have at our disposal a specimen of Neanderthal or Cro-Magnon man, we cannot compare the storytelling abilities of mankind during various stages of its cultural or biological evolution, and we can only speculate about the role of storytelling in the development of the social organization typical of humans.

The experimental methods devised to measure the processing of narrative texts would not work in the case of narrative thinking: it would be just too disruptive to ask a storyteller to press buttons or to answer questions during a performance. And taking an MRI of a novelist in the midst of writing would most likely capture in the same net both distracting thoughts and the creative processes of narrative organization. The close reading of narrative texts has been, so far, the only way to capture the mode of thinking that we call narrative.

The heavily speculative nature of the investigation of narrative as a mode of thinking has given free rein to the imagination of researchers. This may explain why this area of study has inspired a number of theories that inflate the cognitive importance of narrative. Among these inflationary theories let me mention:

- Roger Schank's suggestion that all memories take narrative form.
- Mark Turner's claim that mankind developed language out of a need to tell stories, rather than started telling stories as a result of the greater communicative abilities enabled by language.
- Three claims by Jerome Bruner: (1) Narrative constructs reality ("Narrative Construction"). (2) Identity is a narrative construct (*Making Stories*).<sup>6</sup> (3) Narrative teaches us to perform mind reading, and mind-reading is essential to communal living. Narrative is therefore the foundation of the social organization typical of human societies (*Making Stories*). (This idea that it is through narrative that we learn to perform mind reading has been further developed by Daniel Hutto as the "narrative hypothesis.")
- David Herman's suggestion that experience is not just the subject matter of narrative, but is made possible by the act of storytelling. As he writes — admittedly very tentatively — "we cannot have a notion of a felt experience without narrative" (*Basic Elements* 145), and "narrative affords a basis or context for having an experience in the first place" (153).

Many of these claims can be taken in two ways: one metaphorical and weak, the other literal and strong. It is in the literal sense that they are inflationary: for instance, the idea that narrative constructs reality is widely acceptable if one interprets it as meaning that narrative gives form to that which it represents; but it is highly controversial if one interprets it as meaning that all perceptions or experiences of reality have narrative form, or that reality is inherently a construct of the (narrative) mind.

A trademark of inflationary theories is that they treat narrative as an unanalyzed whole, rather than attributing the effects they claim for storytelling to specific constituents of narrative. According to these theories, it is the innate possession of a narrative faculty, something equivalent to Chomsky's idea of a universal grammar, that allows us to have a self, build a folk psychology, store memories, and capture the felt quality of personal experience. Typical of the discourse of narrative inflation is an inversion of the causal relations that a more traditional view would postulate. In the traditional view, we give the name of "narrative" to a representation that fulfills certain conditions, such as being about characters who conceive goals, experience conflicts, have emotions, perform actions, bring about changes in the world, and so on. In the inflationary view, it is the other way around: narrative is not the product of certain mental operations, but the source of our ability to perform these operations. If we did not have an innate narrative ability, we would not analyze reality in terms of events, agents, actions, goals, plans, success, failure, and changes of state. David Herman captures the essence of this view when he calls narrative a "tool for thinking" and describes it as something that people "use" to communicate certain types of experience.<sup>7</sup> If we take these expressions literally (certainly more literally than Herman means them), the act of storytelling consists of reaching back into one's mind, and grabbing this thing called "narrative" in order to structure experience as a story.

To formulate more precisely the question of the cognitive status of the notion of narrative, let's call the abilities necessary to construct or understand a story A, B and C. Examples of the types of operations that may fill up these variables are: experiencing emotions, having a sense of chronological ordering, being able to infer causal relations between events, and explaining actions by relating actions to goals and plans, this is to say through mind-reading. The dilemma is as follows:

Is it the possession of an innate schema H, a schema inscribed in certain regions of the brain, that enables us to perform A, B or C? In this case, it should be possible to locate H with a very advanced MRI. I call this the top-down interpretation, since it derives individual faculties from a global construct.

Or, is it our innate faculties A, B, and C, which we developed to solve the problems of everyday life, that enable us to communicate by means of stories? In this second interpretation, which I call bottom-up, the narrative schema H is not an autonomous cognitive tool given to us by our biological heritage, but the name that narratologists give to the convergence of the faculties A, B and C. If this view is correct, there is no need for a certain configuration of neurons called "story" to fire in the brain when we process or create narrative texts. As long as we are able



to construct a world populated with individuated agents, identify changes of states, ascribe motivations to the agents, and detect causal relations between events, we understand a text as a story, whether or not we are aware of what we are doing.

The bottom-up interpretation denies that narrative requires specialized mental abilities—by this I mean abilities that we exercise only when we engage in narrative thinking. Imagine that A is causal reasoning, B is sequencing, C is mind reading: we use A when we boil water to cook an egg, B when we plan our time and schedule appointments, and C when we engage in conversation. But we would not call these activities storytelling, even though they involve operations that are crucial to narrative thinking. It is only when A, B and C come together that they produce a narrative. When people lose the ability to tell stories — that is, when people suffer from what Young and Saver call narrative disorders — this loss is not the loss of a global pattern N, but it is due to an inability to perform one of the operations involved in storytelling. In other words, narrative disorders are not a specialized condition that affects only storytelling, while all other faculties remain intact; they are caused by brain damages that result in a loss of individual faculties, such as memory, the ability to distinguish fact from invention, or the ability to organize information into meaningful sequences. People who suffer from narrative disorders are not dysfunctional because they lost their narrative competence; they lost their narrative competence because they are unable to perform one of the cognitive operations that allow people to both handle life and tell stories about it.

A compromise between the two interpretations is to view them as interlinked through a feedback loop. It seems reasonable to claim that stories exercise and consequently reinforce our ability to perform A, B, and C. Stories tell us about problem-solving, about the interplay in life of planned action and random events, about the feelings of other people, about the time-bound nature of human experience, about success and failure, and they could very well help us interpret life according to these categories. But it seems to me that something must come first: either the egg or the chicken. I personally cannot imagine how a child unable to grasp the notions of causality or temporality, and having no clue that other people have minds, would acquire this kind of knowledge if his or her experience were limited to stories. Similarly, I don't see how an autistic child unable to experience emotions could be cured of this condition by being told lots of stories. On the level of the species, I don't see how mankind could have started telling stories if humans did not already have a well-developed reasoning ability. If narrative requires mental operations as fundamental to the survival of the species as causal understanding and mind reading, there are countless other situations in life that require such abilities, and we simply

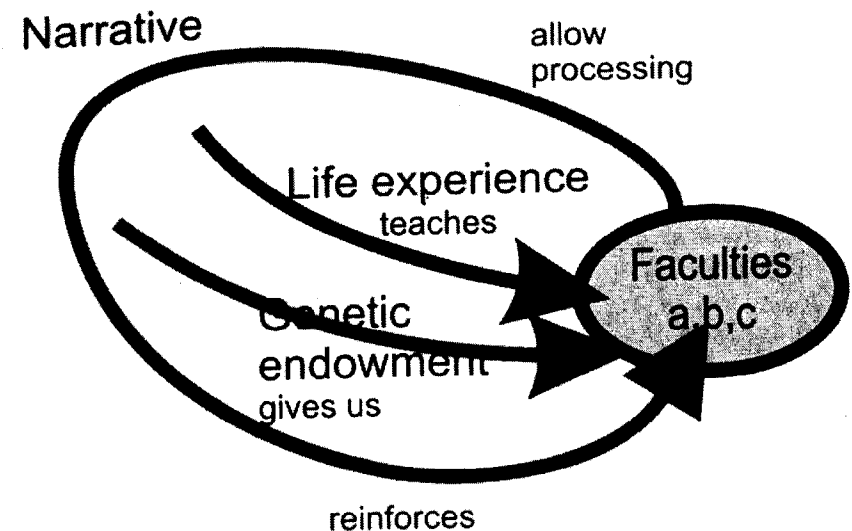


Figure 1: Narrative, life experience, and mental abilities

cannot attribute them to storytelling exclusively. In a feedback loop model of the relations between thinking and stories, narrative reinforces what life teaches us, because narrative, whether factual or fictional, is a representation of life (fig. 1).

In conclusion, I would like to return to the question: what does one do when one does cognitive narratology? The most obvious approach consists of borrowing concepts from the cognitive sciences and applying them top-down to narrative. These concepts tend to come from the softer domains of cognitive science, namely social psychology and philosophy of mind, rather than from experimental approaches, and they are even more speculative than the analytical tools elaborated by narratology through the close reading of texts. The most popular of these imports is the already discussed notion of theory of mind. David Herman ("Storytelling," "Narrative Theory") proposes five additional candidates for top-down application: positioning theory (how narrators of personal experience present themselves in the tale and how characters—including the narrator's—force other characters into roles); embodiment (the ideas that mind and body cannot be separated, and that thinking is profoundly affected by the mind's embodiment); mind as distributed (a view according to which the external objects that stimulate thinking are part of the mind); emotion discourse

and emotionology (scientific theories of the nature of emotions); and *qualia* (the philosophical term for the subjective, felt nature of experience). Another example of top-down method is the work of Alan Palmer ("Social Minds"), who borrows from psychology the idea of a "collective" or "interpersonal" mind to investigate the manifestations of public opinion in novels, such as the mind of the town of Middlemarch in the eponymous novel by George Eliot. At best the imported ideas provide new perspectives on narrative by attracting attention to phenomena that had been overlooked; at worst, there is little connection between the concept and the narrative features that it is supposed to reveal. I personally find Herman's use of positioning theory a productive approach to the relations between characters and to the self-presentation of the storyteller in a narrative of personal experience, but his demonstration of the embodied nature of the mind through the investigation of verbs of movement ("Storytelling") and focalization ("Narrative Theory") makes me wonder what is the point of the analysis: if it is to uncover new aspects of narrative, this will not be done through the study of such well-known devices, but if it is to provide to cognitive science supporting data concerning the embodied nature of the mind, then focalization and verbs of movement do not constitute very convincing evidence. While focalization presents a scene from a certain point in space and time, there is no reason why the mind that occupies this point should be lodged in a body (the freedom with which third-person storytelling shifts point of view and the ability of omniscient narrators to see through opaque barriers suggest indeed a disembodied mind); as for verbs of movements, they appear even in narratives that present the mind as separable from the body, such as stories about out-of-body experiences, about the mindless bodies that we call zombies, or about the mind surviving the body.<sup>8</sup>

One should not expect the top-down applications to narrative of cognitive concepts such as embodiment or distributed cognition to contribute a verification of these conceptions of the mind to cognitive science. Since they do not prescribe an analytical method, these notions leave so much interpretive freedom that researchers will almost inevitably find what they are looking for. Their usefulness resides mainly in their value as heuristic devices. Similarly, the top-down method will not provide a solution to the dilemmas of cognitive science and philosophy: for instance, it is not by analyzing stories that one can decide between the three explanations for theory of mind that have been proposed so far: theory-theory; mental simulation, or Hutto's narrative hypothesis.<sup>9</sup> Nor is it by studying narrative that one can decide between physicalist and dualist solutions to the mind-body problem: even though the physicalist position is currently the dominant one among neuroscientists and

philosophers, narratives usually reflect the view of their time, and numerous stories endorse a dualist position. Only the most over-zealous deconstructionist reading could make these narratives say what they openly deny.

An alternative to the top-down approach is what may be called the convergence method. This method consists of quoting scientific research in support of more or less independently developed theses concerning the reading process. Here, narratology invokes the blessing of science. For instance, Anežka Kuzmíková uses the Zacks and Speer article discussed above (together with a wealth of other cognitive data) to defend the idea that the representation of a body moving through a setting creates a stronger sense of the presence of the storyworld, and therefore a deeper experience of spatial immersion, than a representation limited to the description of static objects. She argues convincingly that the correlations detected by Zacks and Speer between reading about gestures and performing them in real life mean that the reader's mental simulation of the moving body will induce a sense of corporeal connection to the spatial environment described in the text. The convergence method can also be used to situate narratological issues in a larger context. I am thinking here of the review of cognitive approaches to emotions found in Suzanne Keene's study of narrative empathy and in Torben Grodal's study of the emotional power of film, or of the presentation of research concerning autism in Zunshine's study of mind-reading and of levels of intentionality in fiction (*Why We Read*): the purpose of these overviews is not so much to yield a method of analysis as to provide an interesting interdisciplinary background. When these researchers switch from the exposition of scientific theories to the actual analysis of data, however, they must develop their own reading methods. (The same can be said of Herman's top-down applications of cognitive theories.)

In all of these approaches, narratology uses cognitive research; but can narratology contribute something in return to cognitive science? On a very basic level it does: experimental science needs hypotheses to test; where is it going to get these hypotheses, if not from the study of narrative, this is to say, from narratology? When experimental psychologists test issues such as how stories create suspense, how readers deal with inconsistent worlds, to what extent readers keep in mind the goals of characters when these characters are temporarily distracted from their pursuits, or what it means to be immersed in a story, they may or may not have become aware of these questions by reading narratology, but if they asked them on their own, it is because they have become narratologists themselves. Yet the French theorist Jean-Marie Schaeffer doubts that a closer collaboration between experimental and narratological approaches can take place, because cognitive science

and narratology pursue different goals: the former aims at descriptive adequacy, while the latter aims at explanatory value (229-30). For a brain researcher, mapping the narrative mind — that is, locating the cognitive processes necessary to the production or understanding of narrative in certain parts of the brain (cf. Mar) — is an end in itself; for a cognitive narratologist, this mapping is only interesting if it provides insights into the functioning of the narrative mind. Both types of approach try to make accurate predictions, but the narratological approach is theoretically more ambitious, more open to speculation and generalizations, and places more value in creativity.

A genuine collaboration between cognitive narratology and the cognitive sciences would involve a feedback loop, by which narratology would truly learn something from the experimental testing of its own ideas. Feedback will take place between the hard cognitive sciences and narratology when scientific experiments such as brain scans become able to inject new ideas into narratology, rather than verifying commonsensical ideas as they have done so far. But first, narratology needs to develop a better idea of what would constitute interesting scientific results. I would personally find the following discoveries stimulating, because they go against my current beliefs: the detection of a specialized area of the brain associated with aesthetic appreciation (as opposed to different areas activated when pleasurable effects involve different senses or cognitive operations) and the discovery of a region of the brain that become active *only* during the telling and processing of narrative. This second example would mean that narrative production and reception involves more than the activation of mental processes that we use in other aspects of life, and it would lead me to seriously rethink my conception of the nature of narrative.

Until a feedback loop becomes possible, how does one study the nexus of narrative and mind? My answer is quite simple: by asking the right questions. Questions such as:

- What makes a story tellable, and what features can form the point of a story?
- What presentational devices attract the attention of the audience?
- How do stories produce emotions, and why do we experience pleasure when a story concerns tragic events?
- What does it mean to be immersed in a story, and what are the features that favor or inhibit immersion?
- What is fiction and why are we so interested in the fate of characters who never existed?

- Do fiction and nonfiction obey different principles of tellability (i.e., are there types of events which are tellable in one mode and fall flat in the other)?
- What mechanisms allow readers to build a reasonably comprehensive image of the storyworlds out of the very partial information provided by the text?
- How do readers handle contradictions and inconsistent storyworlds?
- What is the nature of an aesthetic experience of narrative?

What are the plot devices and narrative themes that one finds in all cultures and historical periods? (cf. Hogan) (In this list I use the term reader for convenience's sake, but these questions can, and should be asked of all narrative media.)

If there is such a thing as cognitive narratology, it is much less a matter of borrowing ready-made concepts from the cognitive sciences and applying them top-down to texts than a matter of trusting the ability of our own mind to figure out how the mind creates, decodes and uses stories. In other words, cognitive narratology is most productive when it proceeds bottom-up, getting its insights from the texts themselves. When David Herman identifies the object of cognitive narratology as "the nexus of narrative and mind," he defines this nexus as "the mind-relevant aspects of storytelling practices" (*Basic Elements* 140). But aren't *all* aspects of storytelling mind-relevant? You can do cognitive narratology without being aware of it, just as Monsieur Jourdain produced prose in Molière's play *Le Bourgeois Gentilhomme*, because to study narrative is to study the working of the human mind in one of its most basic and complex manifestations.

### Notes

<sup>1</sup> Actually, Speer and her colleagues used fMRI, functional Magnetic Resonance Imaging. Throughout this article, I will use MRI to denote any kind of imaging technique of the brain, since technological matters are not my concern.

<sup>2</sup> Literary critics will probably object that our image of a fictional character is as susceptible to evolve during reading, re-reading, and remembering as our representation of real individuals.

<sup>3</sup> According to a recent article in *Scientific American Mind* (Bor), MRI can tell about which one of two pre-selected topics subjects are thinking: tennis or the layout of their home. The subjects were told to think about tennis if they wanted to answer "yes" to a question and about their home to answer "no." This is the closest to mind reading that technology has come so far.

<sup>4</sup> According to Cohen (3), however, a project is underway at Yale under the direction of Michael Holquist that uses MRIs to test the reactions of readers to complex literary texts.

<sup>5</sup> The practical limits of recursion in the calculation of levels of intentionality are suggested by an actual World War II spy case. In his book *Operation Mincemeat*, Ben McIntyre describes how the British made a badly decomposed body float off the coast of Spain and let it be intercepted by the Germans, who found on it a confidential letter saying that the Allies were about to attack Greece and Sardinia to begin their reconquest of Southern Europe. At this point, as Malcolm Gladwell observes in a *New Yorker* review of the book, three things could happen: 1. The Germans take the message at face value, and prepare for an attack in Greece and Sardinia (which they did). 2. The Germans suspect that the British, who want them to falsely believe that they will attack Greece and Sardinia, have planted the corpse; hence, they prepare for an invasion on Sicily (this would mean foiling the actual British plan). 3. The Germans find the planting of the corpse a little too obvious, and conclude that the British want to trick the Germans into thinking that the British wants them to falsely believe that they will attack Greece and Sardinia. By the principle of double negation, this means that the British *really* want to attack Greece and Sardinia (since the point of their plan is to make the Germans believe that it is false that they will attack these targets). This would mean overestimating the sophistication of the British plan. Gladwell offers this case as evidence of the ultimate futility of spying operations: when one uncovers a spying scheme, one can never be certain whether it is a case of deception (interpretation 2) or double deception (interpretation 3). If there is no way to decide whether interpretation 2 or 3 is correct, it would be pointless to imagine further levels of intentionality: they would all alternate between "attack on Sicily" and "attack on Sardinia."

<sup>6</sup> Galen Strawson has attacked this claim in a famous paper.

<sup>7</sup> For instance in this sentence: "*UFO or the Devil* [a story told orally] uses narrative to stage a dispute between competing accounts of the world-as-experienced" (2009:151). Here it is the narrative that uses narrative, but the title *UFO or the Devil* stands metonymically for the teller of the tale.

<sup>8</sup> One way to support the view that narrative presents the mind as embodied, regardless of how it conceives the mind-body problem, is to invoke the presence in a text of the kind of frozen metaphors that uses the body as implicit standard of reference: for instance, metaphors that presupposes the body's upright position, such as expressions relying on the contrast between up and down (cf. Lakoff and Johnson). But these metaphors are a general feature of language, not a specific

feature of narrative. They would probably be just as frequent in expository as in narrative discourse.

<sup>9</sup> Narratologists such as Herman (*Basic Elements*) and Palmer tend to favor Hutto's explanation, probably because it boosts the importance of storytelling.

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