



The Neuroscience of Metafilm

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Abstract: Metafictions tell stories in which the physical medium of the story becomes part of the story as, classically, in *Tristram Shandy* or *Don Quixote*. In our times, both metafiction and metafilm have proliferated. Examples of metafilm include Buster Keaton's *Sherlock Jr.*, Woody Allen's *Purple Rose of Cairo*, Alejandro Amenábar's *Abre los Ojos*, Ingmar Bergman's *Persona*, the Marx Brothers' *Horse Feathers*, and, in particular, Spike Jonze's *Adaptation*. In my experience and that of others, metafilmic movies have a peculiarly disconcerting effect, sometimes arousing fear, sometimes seeming comic. Why? Metafilms play tricks on the levels and kinds of our belief (or our suspension of disbelief). To explain the effect, we need to understand how our brains are functioning when we are, as we say, "absorbed" in a film. The answer lies in the fact that reality testing depends on activity in the motor regions of the frontal cortex. But in experiencing the arts, we are not moving or even planning to move. As a result, as Richard Gerrig's experiments show, we momentarily believe (or suspend disbelief in) the film we are perceiving. Metafilm, however, introduces another, more real reality, the physical medium of the film. Metafilm thus sends conflicting messages to the brain about moving. The result is what Freud called "a signal of anxiety." If the metafilmic effect is brief, we laugh. If it persists over time, it can arouse anxiety.

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"Metafilm," as a term, derives from "metafiction." What is "metafiction"? What does this meta- prefix denote? Originally coined by William Gass in 1970, as time went on, "metafiction" came to mean "a fiction that both creates an illusion and lays bare that illusion" (Waugh 1984, 6). But the term has since expanded and expanded, becoming ever more grandiose, until it now includes any fiction that even mentions the idea of fiction. That can cover a lot of things, starting with the Bible and the *Iliad*.

I want to be more specific. I would like to go back to the original definition, because I think it is more precise and because it better fits the brain operations involved. Metafictions—and therefore metafilms—tell stories in which *the physical medium of the story becomes part of the story*.

Metafictions, Metatheater, Metafilm

Among contemporary writers of fiction one could instance as examples of metafiction writers, my erstwhile colleagues, John Barth, Donald Barthelme, and Ray Federman. Others are Jorge Luis Borges, Italo Calvino, Vladimir Nabokov, Umberto Eco, John Fowles, Salman Rushdie, and on and on. Metafiction has become extremely popular in our questioning centuries, the twentieth and twenty-first. We have trouble with belief, and the “meta-media,” metafiction and the rest, play with our beliefs.

Metanarratives (to introduce a generic term) lead to some of the more dizzying effects possible in literature. I am thinking of those novels that are novels about writing the novel that is the novel. In Doris Lessing’s *The Golden Notebook*, for example, one of the notebooks tells about a novelist trying to write a novel. A friend asks her to give him the first sentence, and the novelist rattles off the first sentence of *The Golden Notebook* itself. I become puzzled. What is real here? Am I reading fiction or fact?

But surely the genial grandfather who sired all these effects is that first and greatest of metafiction, *Don Quixote*. *Don Quixote*, although it is the earliest of the great novels already plays metafictional games.

The book begins in uncertainty, telling us that we cannot be sure where *Don Quixote* comes from or what his name is or who is writing this book. What are we to believe? At one point *Don Quixote* chooses for his knightly title the “Knight of the Sad Countenance”—why? The book tells us. He chooses the name not from a fictional impulse from his fictional brain, but because the (real?) writer of his history makes him do so. Is this then a “real” history or just something the writer (whoever he may be) imposes?

The book turns fully metafictional when Part I (published in 1605) is followed by Part II (published in 1615). The fictional characters of Part II go on to discuss errors and distortions in Part I and even the sales figures for Part I. *Don Quixote* finds, as he proceeds through Part II, that everybody knows about him and his goofy knight-errantry because so many people have read Part I. These readers—are they real readers? or are they fictional readers?—these readers go on to have discussions and play tricks on *Don Quixote* motivated by Part I.

The meta- games get even more complicated. One Avalleneda has written a false sequel to Part I (and there was in reality such a book). The knight makes a point of discrediting it: its *Don Quixote* and Sancho are not at all like the “real” *Don Quixote* and Sancho. The “real” author of the novel (Benengeli? Cervantes?) then has a reader of the fake *Don Quixote*, Part II, swear an oath before a notary public that the “real” *Don Quixote* and Sancho are not at all like the ones in the plagiarist’s novel.

Drama gets this effect and becomes metadrama or metatheater, for example, in Pirandello’s *Six Characters in Search of an Author*. The six characters

wander about the stage looking for a playwright to write the play which is, of course, the play we are watching. Am I watching a fictional play or am I to think these actors are in fact not acting but looking for work in their and my real world?

Metafilm

Finally, we also have metafilm. There are examples of metafilm as far back as the silent era. In 1924, in Buster Keaton's *Sherlock Jr.*, Keaton plays a movie projectionist who has ambitions to become a detective. The movie has the projector projecting the hero's fantasies into the very film that embodies both those fantasies and the projector.

Woody Allen's *Purple Rose of Cairo* (1985) plays the same kind of trick, using a movie-within-the-movie. The frame movie tells of a brutal husband and an unhappy wife who escapes to the movies. The movie she sees deals with a romantic archaeologist who then steps down off the screen and intervenes in the wife's sad story. Then, when other onscreen representations of this archaeologist try leaving the screen in other theatres, the Hollywood moguls put a stop to it all. But notice: the wife exists on one level of reality, the ordinary movie, while the archaeologist exists on another level of reality, the movie within the movie, which reminds us that the ordinary movie is, in fact, a movie.

The 1997 Spanish film by Alejandro Amenábar, *Abre los Ojos* (*Open Your Eyes*) turns itself on its head. What we have been watching, the story of the movie, we find out, was a dream installed by the cryogenic team who have preserved the hero's body for eventual awakening from death.

Probably the most striking metafilmic moment in movies occurs in Ingmar Bergman's *Persona* (1966). Midway through this film, at a point where one of the two women in the film becomes violently angry at the other, the film seemingly starts to burn. You see on the screen a burning hole in a bubbling frame of film with light shining through it as if something had gone wrong with the projector. Indeed, so realistic is the effect that some of the projectionists showing the film ran for their fire extinguishers. But the film is not burning. In fact, we are seeing a fictional film about that same film's own celluloid burning.

My briefest example of metafilm comes in the Marx Brothers' *Horse Feathers* (1932). Groucho turns to the camera, that is, the audience—us—and comments on the film he is in, "I've gotta stay here, but there's no reason you folks shouldn't go out in the lobby till this thing blows over."

I could multiply examples indefinitely. One of the amateur reviewers (tedg) on the Internet Movie Database (IMDb) comments that, of the nearly 1000 comments he or she has written, a third contain this kind of metafilmic turn.

I will confine myself to one telling example of the genre, because it offers us a documented emotional reaction to the phenomenon (as opposed to puzzlement or evaluation, like the IMDb entries). Spike Jonze's 2002 movie *Adaptation* shows us Charlie Kaufman (a real-life screenwriter, *Being John Malkovich*) trying to write a screenplay (Figure 1). A gloomy obsessive-compulsive, Charlie is suffering from writer's block as he tries to write a movie based on a factual article and book about orchid stealing, a book that exists in real life. (Why would writing a movie about orchid stealing lead to writer's block? Our word "orchid" comes from the Greek word *orchis* which means testicle, but that

As the plot develops, the writers of the film become characters in the (fictional) film that they are writing and I am watching. I find such effects not only confusing but peculiarly unsettling, and so do other people.

leads to another kind of paper, not a neuroscientific one.)

In this movie real-life Charlie Kaufman, who is a character in the movie, is outdone as a screenwriter by his devil-may-care twin brother Donald (who is totally fictitious, but played by the same actor, Nicolas Cage, who plays Charlie; Figure 2). This twinning pays an *hommage* to the twin Epsteins ultimately responsible for *Casablanca* (spelled out in the film). At any rate, both real-life Charlie and fictitious Donald appear in the credits for the film. And both get into its action, particularly the bizarre ending, which comes from following and violating the strictures of a screenwriting course both the brothers attend. And at the very, very end of the film, after all the screen credits and copyright notices have rolled, a title card says, "In Loving Memory of Donald Kaufman." To top the joke, in 2003, both Charlie and Donald were nominated for the Oscar for best screenplay based on an "adaptation" of previously published material.

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Figure 1. In *Adaptation* Charlie Kaufman, a real-life screenwriter, tries to write a screenplay.



Figure 2. Charlie is outdone as a screenwriter by his twin brother Donald, also played by Nicolas Cage.

Adaptation, according to its New York Times reviewer, A. O. Scott, “is . . . a movie about its own nonexistence.” Scott goes on to say something very interesting. He describes his reaction to the film using such terms as “panic,” “frantic anxiety,” or “paranoid.” Like Scott, I too feel dizzy and uncertain but at the same time delighted at this playing with levels of reality. Most reviewers thought the film’s toying with reality was a big joke, but Scott and I got nervous. But why “panic”? Why “anxiety”? And why a joke?

To all these meta-narratives, and particularly metafilm, we are getting two kinds of response, sometimes both at once. If the effect is very short, like Groucho’s remark, we laugh; it’s a joke. If the effect goes on for a while, as it does in *Adaptation* or *Purple Rose of Cairo*, some of us get tense, edgy, a little nervous, a little dizzy. We can begin with the second response, the nervousness.

Why Does Metafiction Make Us Nervous?

Psychoanalysis gives us one kind of explanation, the psychodynamic. In all these metafictional works, I am getting that strange feeling Freud called the “uncanny.” It is the vertigo we get when something familiar suddenly seems strange and unfamiliar, like unexpectedly seeing yourself in a mirror. (That happened to Freud, and it has happened to me.) It’s the feeling you get from reading stories about doubles, ghosts, or the undead.

Freud described and explained the “uncanny” this way: “An uncanny experience occurs either when infantile complexes which have been repressed are once more revived by some impression, or when primitive beliefs which have

been surmounted seem once more to be confirmed” (Freud 1919h, 248). Now, I can understand why the return of fears and fantasies repressed in childhood, if something makes them seem true, would evoke the same anxiety that led to their repression in the first place. But why should “primitive beliefs” inspire fear? Beliefs (*Überzeugungen*) are intellectual, not emotional. They should not elicit anxiety. Freud explains the belief form of the uncanny with the claim that primitive beliefs are intimately connected with infantile complexes, a questionable claim.

Freud goes on to discuss the uncanny in literature. He notes that in fairy tales and other non-realistic narratives, wish-fulfillments, secret powers, animation of inanimate objects, and so on, can have no uncanny effect, because the writer and reader have abandoned everyday reality from the start. In realistic literature, however, he claims that “we react to [the writer’s] inventions as we would have reacted to real experiences,” and the writer can produce exaggerated effects (Freud 1919, 250–251). Again, I doubt that this is an accurate statement of readers’ responses either to literature or to film. But I also think Freud is right in suggesting that the issue of belief is crucial.

Does our anxiety come from some primitive belief that any story—be it realistic like *Casablanca* or fanciful like *The Matrix*—that any story you view or read or hear may be true? And does the uncanny feeling, the anxiety, come from the physical book making it seem that the story is itself a physical truth? The question is, What do we believe when we are reading a story?

“Poetic Faith”

Coleridge stated an answer that has stood pretty much unchallenged since 1817, when he asked in *Biographia Literaria* (ch. xiv) that the readers of *Lyrical Ballads* grant his poems about the supernatural “that willing suspension of disbelief for the moment that constitutes poetic faith.” In the 1980s and 1990s, however, Richard Gerrig conducted some remarkable experiments that bear on this question. They suggest that Coleridge’s second phrase, “poetic faith,” describes our state of mind better than his first, the more famous, “willing suspension of disbelief.”

Gerrig had his subjects (Yale students) read a little story. And at the end of the story Gerrig would ask the subject to say whether a certain sentence was true or false. One version was called the “no suspense” version. Here is one of them:

George Washington was a famous figure after the Revolutionary War. Washington was a popular choice to lead the new country. Few people had thought that the British could be defeated. The success of the Revolutionary War was attributed largely to Washington. His friends worked to convince him to go on serving his country. Washington agreed that he had abundant experience as a leader.

The other version of the story was designed to create a little uncertainty about the outcome. In other words, this second version was designed to create suspense. Here is one of those:

Washington was a popular choice to lead the new country. Washington, however, wanted to retire after the war. The long years as general had left him tired and frail. Washington wrote that he would be unable to accept the nomination. Attention turned to John Adams as the next most qualified candidate.

Gerrig then asked his subjects to say whether this sentence, “George Washington was elected first president of the United States,” was true or false. What Gerrig found was that the response time was significantly longer for subjects who had read stories that created some uncertainty as to whether Washington would be our first president or not. The readers experienced suspense, and Gerrig called this phenomenon “anomalous suspense.” The suspense is anomalous because all his subjects knew perfectly well that in fact George Washington was elected our first president. So why the hesitation? Gerrig concluded that the delay showed there was “anomalous suspense”—that the answer came more slowly because the suspense, the narrated uncertainty, made the subjects believe in some temporary way that maybe George Washington did not become the first president.

You can see the same phenomenon in children. They have heard the story of *The Little Engine That Could* a zillion times, but every time, when the locomotive nears the top of the mountain, they get excited—will he make it to the top? We adults experience the same phenomenon when we watch a movie like *Casablanca* for the umpteenth time. Will Rick put Ilsa on the plane with Laszlo? You know at one level of your mind that he will, but you still feel suspense. As Gerrig puts it, you have to actively construct disbelief.

Notice too that the stories Gerrig used were *non-fiction*. They were factual stories about American history and pop culture and other things his Yale student subjects would know. Gerrig’s point is: you listen to *any* narrative, and you believe it, whether you think you are reading fiction or non-fiction. Anomalous suspense happens simply because we are hearing narrative.

What Gerrig discovered is important for more than just books or films. Think back to Ronald Reagan, “the Great Communicator.” Why was he the Great Communicator? Because he would make his points with stories. I remember the story about the welfare queen who drove up to collect her check in her Cadillac. It turned out that there was no welfare queen and no Cadillac. It was just a story, an urban legend, if you will. But even after that was pointed out, people would still repeat the story. People would still believe that there were those who were getting rich on welfare. As Gerrig says, you have to make an active effort to disbelieve. When someone tells you a story, you believe it

despite what you know to the contrary—as we have seen all too often in the political sphere.

How does this bear on the phenomenon of metafilm and metafiction? We can combine the experimental with the psychoanalytic. If we put Freud together with Gerrig, we begin to get an answer to the puzzle. Why do these meta-genres—metafilm, metadrama, metafiction—make some people edgy? Why do they seem to other people like a joke? Freud answered in terms of cognitive beliefs, a kind of intellectual puzzle about the reality status of a story we hear. Now comes Gerrig and tells us that we *automatically believe* stories and movies and plays. We have to actively construct disbelief. So it is a question of conflicting beliefs.

But the emotion, be it anxiety or laughter, tells me that these reactions have to do with more than just belief. They do not come simply from an intellectual puzzle. Why should I feel slightly *anxious* when a director puts the supposed fiction I am watching at the same level of reality as the physical movie or screen or theater? Something is happening in my brain. What is that something?

Brains and Actions

From a neuropsychological or neuro-psychoanalytic point of view, the place to start is with the basic function of a brain. What is a brain for? Sponges do not have brains, and they do very well. Trees do not have brains and they are bigger and older than we are. Sponges and trees do not need brains, because they do not move. Ultimately a brain has only one function: to move an organism through the world so that that organism can survive and reproduce (Kalat 2001, 224). All the other fancier functions of the brain, vision, hearing, memory, learning, metafiction, metafilm, but particularly the executive function in the frontal brain—they all serve that one purpose, moving us around. Even purely intellectual activities like poetry or philosophy or chess add to ideas that we will someday use in moving.

That is why there are ten times as many connections back from our frontal lobes—the thinking, planning part of the brain, the executive function that motivates actions—to the thalamus, the sensory gateway, as there are from the thalamus forward. Why? Because the executive part of the brain is telling the thalamus to let through only the sensory information needed to move this organism. In fact, the brain is telling the sensory regions of the brain simply to ignore any sensory information that does not help move this body.

In order to move and to plan actions, we imagine situations. Suppose I want to push aside the book on the table in front of me. In order to tell my arms and legs to make the necessary moves, I have to imagine where I want that book to be. *I have to imagine something that is not actually the case.* Neuropsychologists call this something a “counterfactual.” I feed forward to my systems for planning actions a counterfactual, the future position of that

book, which is not what “is.” Our brains seek our survival and reproduction through goals that we must *imagine* ahead of time.

In general, we humans simulate in order to arrive at the best, the most appropriate physical actions. If I do X, then Y will happen. If I do A, then B will happen. I have to imagine all four, X, Y, A, and B. None is real. Each is a counterfactual. Then, emotion takes over. If Y *feels* worse than B, I choose A. In short, in order to act, we generate counterfactuals so as to see how they feel, and we select the one that feels best to us. Once we have imagined the consequences, we act out what feels good and right. Ultimately, emotions guide our choices. We obey Freud’s “pleasure principle” or, more accurately, his “unpleasure principle.” We avoid unpleasure. We especially avoid anxiety. Why, then, do we feel anxiety in the middle of a metafilm that we are enjoying?

A Neuropsychological Answer

Neuropsychology has long established that we assess the reality of a stimulus only if we act or plan to act in response to that stimulus (Chelazzi et al. 1998; Hobson 1995, ch. 6; Rolls 1995; Knight and Grabowecky 1995; Kahneman and Miller 1986). The brain is an economical creature. If we are not going to act on something or not even going to plan to act on it, why bother to decide whether it is real or not?

Let me appeal to the authority of neuroscientists on this matter. This is Andy Clark: “Perception is itself tangled up with specific possibilities of action—so tangled up, in fact, that the job of central cognition often ceases to exist” (1997: 51). And this is Rodolfo Llinás: “What I must stress . . . is that the brain’s understanding of anything, whether factual or abstract, arises from our manipulations of the external world, by our moving within the world and thus from our sensory-derived experience of it” (2001: 58-59). And two specialists in frontal lobe function, Robert T. Knight and Marcia Grabowecky, put the principle this way: “Reality checking involves a continual assessment of the relation between behavior and the environment” (1995: 1360).

We know that the counterfactual goals we imagine are not real. We know that the physical state of things as they are is real. To change the way things are to the way we want them to be, we have to be clear about what is real and what is imagined. If we are going to change things, we have to reality-test. But if we are not going to change things, we don’t need to reality-test. In short, reality-testing in our brains, distinguishing what is real from what is imagined, depends on our acting or intending to act.

The Arts Situation

Consider, then, the paradoxical situation of the arts. With films and other works of art, we are not going to move. It was Kant who pointed out that the fundamental thing about literature and the other arts is that we take an atti-

tude toward them that he described as “disinterestedness” (Kant [1790] 2000: pt. I, bk 1.2; see also Hospers 1967). Kant authoritatively established this basic principle of aesthetics, but aestheticians both before and after Kant have generally agreed. Kant gave us a nice long German word for the phenomenon: *interesselosigkeit*, disinterestedness. (One must remind students that being disinterested is not the same as being *uninterested*.)

When we take pleasure in something beautiful, something that gives us aesthetic delight, we are not desiring to possess it or use it. We don’t treat it as a means to an end, and we don’t try to think like critics and judge it or analyze it. That is an activity of mind that counters simple enjoyment. Engrossed, rapt, we just try to enjoy the work of art. If we are experiencing the work of art for its own sake, we simply take pleasure in it, *we do not act toward that work of art or the world around it*. We sit in our armchair or our seat in the theater, and we enjoy the narrative.

This means that art and literature occupy a special, paradoxical place among human activities. We have a brain designed for the sole purpose of action that enables us to enjoy works of art—precisely because we agree not to act on them.

Action and Film

Now, imagine you and me sitting in the local Bijou watching *Adaptation*. Something very different is happening to us from the characters’ struggling around swamps looking for orchids. They may be moving, but we are not. We are simply sitting in a movie theater enjoying *Adaptation*. And we know we are not going to move. To use Kant’s precise term, we are disinterested.

Since we are not planning to act, we are not generating counterfactuals. We are not imagining the world as we would like it to be. We may be understanding the cuts or flashbacks, filling in the story, adding in a background for one of the characters, or working out cause and effect. But we are not imagining actions in the world outside the story. Instead, the story itself, the film or the television program, is giving us a constant stream of counterfactuals in place of the ones we would normally imagine for ourselves. Whatever imagining we do simply fits in with the imagining the film does for us, like putting a state of mind to a face in a close-up. What we imagine has nothing to do with action. We are, as we say, “passive.”

When I am absorbed in a film and getting pleasure from in it, I have agreed in my mind that I will not act. If I can’t act towards something, it doesn’t matter whether it’s real or not real. I need not check the reality of what I perceive, and I don’t. As Gerrig’s experiments show, I will believe a story, at least temporarily, until I have some reason not to.

I believe what I see onscreen—and metafilm confuses me—because I have shut down my systems for moving in the world, and, as a result, I have shut

down my systems for reality-testing. What are these systems? How do we humans move in daily life, when we are not at the movies?

What the Prefrontal Cortex Does

We can imagine the motor system in our brains and bodies as a long feedback loop. The executive system in the prefrontal cortex decides on some general plan of action and that impulse travels backward through the frontal lobe, activating more and more specific elements of the action. The cortical impulse innervates the basal ganglia deep in the middle of the brain. That is an earlier (pre-human) part of the brain, where we activate or inhibit the programs for relatively fixed actions like walking or grasping. The impulse to act, having been spelled out in detail, as it were, by these relatively advanced systems, travels to the primitive (or reptilian) brain stem and on to the cranial nerves and through the spinal cord to particular motor neurons in the lower body that send the appropriate commands to particular muscles. The body moves. Then other nerves feed back what has happened. Impulses in the musculature send data up to the sensory regions in the posterior lobes of the brain. The information goes particularly to the parietal lobe, which monitors proprioceptive information. Systems there pass information through the thalamus to the executive function in the front brain, telling it what happened with the body's movement.

The keystone of this loop, the crucial initiator of it all, lies in the prefrontal cortex, and, within the prefrontal cortex, probably the dorsolateral prefrontal cortex (Brodmann areas 46 and 9). "It is clear," says Oxford psychologist Richard Passingham, "that the dorsolateral prefrontal cortex plays an important role in the spontaneous generation of movements" (Passingham 1993: 152; see also 25–153). There, we instigate actions and judge whether they turned out as we had planned.

Patients with prefrontal damage suffer from an inability to generate coherent representations of alternate or counterfactual realities. They have deficits in generating and evaluating counterfactual scenarios. They have what Kay Young and Jeffrey Saver (2001) call "dysnarrativia." Theirs is a favorite paper with literary people, because it is a true collaboration between the disciplines: Saver is a neurologist; Young, his wife, is an English teacher. The patients they studied do not generate counterfactuals well. In addition, they have deficits in the inhibitory control, the do-not-act, that is also based in the prefrontal cortex. "Confidently monitoring and adjusting of one's behavior is a key component of human cognition," writes a neuropsychological team. "Evidence from neurological patients suggests that this capacity is dependent on the evolution of the dorsolateral prefrontal cortex" (Knight and Grabowecki 1995: Table 90.1; see also Knight, Grabowecky and Scabini 1995). Frontal lobe patients suffer from what neurologists call "utilization behavior." If you put a

pencil in front of them, for example, they will pick it up and begin to doodle or write. If you put a comb in front of them, they will use it. “The patients’ behavior was striking, as though implicit in the environment was an order to respond to the situation in which they found themselves” (Passingham 1993, 25–153, 152; see also Knight, Grabowecky and Scabini 1995; see also Lhermtte 1986).

I was talking to a neuropsychologist about this phenomenon, and he offered me some anecdotal evidence. He has a relative with frontal lobe damage. When he goes to the movies with this relative, the man can’t sit still. He squirms around. He talks to the screen. He jumps up and down. In short, he lacks the inhibitory control not to act in response to a story. Dorsolateral prefrontal cortex is essential for planning, choosing among, and executing or inhibiting actions. It is in systems receiving information from the dorsolateral prefrontal cortex that sensory and cognitive information becomes translated into a decision about action. It is in those systems that we decide whether we are going to act or not.

Watching a DVD at home, however, we can always do something and often do. We get up to go to the bathroom or to get a second glass of wine. Consequently, we find it harder to “lose ourselves” in a film at home. By contrast, seeing a film in a theater with an audience around us, the decision not to act rests partly on social grounds. That is, we should not disturb the audience around us. Probably, then, the right hemisphere’s prefrontal cortex plays more of a role in this brain activity than the left’s. “The right hemisphere,” according to another pair of neuropsychologists, “has a greater capacity for dealing with informational complexity and for processing many modes of representation within a single task, whereas the left hemisphere is superior at tasks requiring detailed fixation on a single, often repetitive, mode of representation or execution” (Springer and Deutsch 1998, 310, citing Goldberg and Costa 1981). Responding to metafilm is surely a task with informational complexity.

In short, we turn off a system (ultimately governed, probably, by the right dorsolateral prefrontal cortex) that had been using the total literary context to make predictions about my bodily situation in the world of things and my fellow humans. I was not going to act. I was not even contemplating the possibility of action. I was not imagining counterfactuals. I was not interpreting or critiquing. I was not, therefore, testing reality or probability.

But now that system has been fooled, and (so to speak) it “knows” it has been fooled. Suddenly the film about writer Charlie Kaufman isn’t just a story—it is a physical fact happening on the screen in front of me. In my experience of it, it has acquired a different kind of reality from the narrative I was temporarily believing. The physical reality of the movie being written in the story makes me realize that my temporary belief in the movie was mistaken. Its story was only a story, and this new thing is “real.” Or, alternatively, it suggests that the story I am believing in is as real as the film I am watching

(Berns, Cohen, and Mintun 1997). I begin to substitute my own counterfactuals for those that I had been getting from the book, the play, or the movie. I start thinking about and judging the reality or unreality, the truth or untruth, of the story I have been enjoying. I suddenly feel a contradiction in my perceptions. Is what I am perceiving just a story or is it something real? I will begin to feel a vague sense of having to do something, but at the same time I know that part of what I am perceiving is a fiction.

Our brains are wired, as all animals' brains are wired, so that, whenever any new thing pops into our environment, we have to pay attention to it. This novelty could be a threat or an opportunity for sex or maybe just food, and that is why we have to pay attention. What should I be doing about this new thing? How will I cope with this? How will I act toward it? What will I *do*?

Now, for a given piece of the world (the movie) the executive function of my brain is getting two inconsistent signals. One says, Be ready to act. The other says, Don't act. In effect, I am asking the dorsolateral prefrontal cortex to set my brain both for non-action and action (Passingham 1993, 222–237).

In your brain, this contradiction in perception, this metafilmic shift between reality and unreality, between belief and disbelief, mobilizes your systems for attention. In psychodynamic terms, this novelty, this confusion of the two levels, leads to what Freud called a "signal of anxiety." Such a signal mobilizes your defenses and adaptations, that is, your characteristic ways of coping with inner and outer reality (Freud 1926d, 92; 83).

At first everything was clear. The book I was holding was real. The screen and theater were real. The events pictured on the screen were fictional, but I believed in those events, and I ignored my knowledge that this is only a movie. I felt "anomalous suspense." I put my knowledge that this was only a story aside. But then comes the metafilmic turn. The book becomes part of the story. I am reminded that this is only a story. Or alternatively I am being told that the fictional events portrayed are the same kind of thing as the physical screen I am watching or the physical theater where I am sitting. My brain now has to figure out this new situation. What systems do I engage or disengage to deal with this strange phenomenon?

The filmmaker's mingling reality with unreality, in short, gives me the slightly anxious feeling that Freud called "the uncanny." The metafilmic effect rests on a childish belief that the story might be true or real. And I can have this false belief because I am not going to act. My "poetic faith" or "suspension of disbelief," my being "rapt" and "absorbed" in the story because I was not going to act, comes to an end.

What should I be doing about this new situation, this discrepancy? The faint call to action involves a slight tensing up. And that is how a puzzle about belief created by the writers of metafiction, metadrama, and metafilm leads to that faint feeling of anxiety or in the case of A. O. Scott, "frantic anxiety." Or

alternatively, the mix-up of fictional and real, the incongruity, creates a pattern of surprise followed by coherence. We are surprised by the intrusion of the real screenwriter, but we realize that none of this matters. This is just a movie. We get the pattern of a slight threat followed by a dissolution of the threat, the standard pattern that the neuropsychologists tell us leads to mirth and laughter (Brownell et al. 1983).

Conclusion

In “metamedia,” the physical medium of the narrative becomes part of the narrative. We can act on that physical medium but we cannot act in the narrative. Our brains have one purpose: moving our bodies. Without some plan for motion or action, we don’t reality-test. That is our situation when we are really into a movie, engrossed in it, rapt, lost in it. When we see a movie, we get suckered into believing it. And it doesn’t matter whether it is a narrative film or a documentary. We put aside things that we know perfectly well, notably our knowledge that “this is just a movie,” “this is just television,” and so on.

But then suddenly into that imaginary world pops a real physical thing to which, moreover, I am motor connected, the theater, the screen, or the book. My brain (probably the right dorsolateral frontal lobe that initiates movement within social constraints), gets two inconsistent messages: “Get ready to move” and “Don’t move.” As a result, I am confused. I am disconcerted. This new thing could be a threat.

Mixing the physical medium with the story that that physical medium is telling leads to a slight feeling of anxiety, something like Freud’s “uncanny” or his “signal of anxiety.” If the uncertainty persists, I feel edgy and tense like the New York Times critic with *Adaptation*. If the uncertainty, the possible threat, is quickly resolved, then I sense it is a joke, like Groucho’s remark. And that, I think, is how neuropsychology explains the effect of metafilm.

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