

Three Emotional Stories: Reflections on Memory, the Imagination, Narrative, and the Self

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In this essay, I propose that memory and the imagination partake of the same mental processes: that they are driven by emotion and often take narrative form. Through reflective self-consciousness, human beings are not bound to the phenomenal present. They can recall themselves in the past, imagine themselves in the future, and inhabit fictive realms. Borrowing William James's distinction between narrative thought and reasoning, as well as the difference between first- and third-person perspectives, I describe the varying approaches of fiction, psychoanalysis, and neuroscience to remembering and imagining. Conscious episodic memories are consolidated by emotion, but they are also reconsolidated—subject to Freud's "deferred action"—to *fictionalizing* over time. Story organizes the affective material of memory into a temporal, linguistic schema that is necessarily dialogical: "I" implies "you." As articulated representation, narrative recollection inevitably distances and cools past emotion. This is not true of involuntary and traumatic memories that are sensorimotor, affective replays of an event, are not codified in language, and cannot be located in a subjective time or space. Research into self- versus other-"processing" in the brain has largely failed to understand that at an explicit, representational level, there is no difference between memories and fantasies about self and other. Culling insights from Freud and research in neuroscience and phenomenology, I argue that a core bodily, affective, timeless self is the ground of the narrative, temporal self, of autobiographical memory, and of fiction and that the secret to creativity lies not in the so-called higher cognitive processes, but in dreamlike reconfigurations of emotional meanings that take place unconsciously.

Keywords: emotion; imagination; memory; narrative; self; time

In a 1995 essay on memory, "Yonder," I wrote the following sentence: "Writing fiction is like remembering what never happened" (p. 41). It seemed to me fifteen years ago, and still seems to me today, that the mental activity we call memory and what we call the imagination partake of the same mental processes. They are both bound up with emotion and, when they are conscious, often take the form of stories. Emotion, memory, imagination, story—these are all vital to our subjective mental landscapes, central to literature and psychoanalysis, and, much more recently, hot topics in the neurosciences.

Ever since Plato banned poets from his Republic, philosophers have debated the role of imagination and its link to memory. Traditionally, imagination referred to the mental pictures we conjure in our minds, as opposed to direct perception. For thinkers as diverse as Aristotle, Descartes, Kant, and Hegel, the imagination occupied a middle zone between the bodily senses

and intellect. Augustine connected imagination to both emotion and will. The will directs internal vision toward memories, but it also transforms and recombines them to create something new (Brann, 1991). "My memory," Augustine writes in *Confessions*, "also contains my feelings, not in the same way as they are present to the mind when it experiences them, but in a quite different way that is in keeping with the special powers of the memory." The emotions, Augustine tells us, are all there—desire, joy, fear and sorrow—and they can all be called to mind, but:

If we had to experience sorrow or fear every time that we mentioned these emotions, no one would be willing to speak of them. Yet we could not speak of them at all unless we could find in our memory not only the sounds of their names, which we retain as images imprinted on the memory by the senses of the body, but also the idea of the emotions themselves. [Augustine, 1988, pp. 220–221]

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Surely, Augustine's thoughts remain cogent: remembering is not the same as perceiving. We remember what we have perceived, although we need ideas or concepts and names—*language*—to recognize and organize the material we have brought to mind. The seventeenth-century Italian philosopher and historian Giambattista Vico regarded memory and imagination as part of the same faculty, rooted in sense perceptions. The imagination, he wrote, is “expanded or compounded memory,” and memory, sensation, and imagination are skills of the body: “It is true,” he insisted, “that these faculties appertain to the mind, but they have their roots in the body and draw their strength from it” (quoted in Luft, 2003, p. 143).

Vico's comment is startlingly like the phenomenology of the twentieth-century French philosopher Maurice Merleau-Ponty [1908–1961], who understood imagination as an embodied reality, dependent on sensory perceptions, but which nevertheless allows us entrance into possible, even fictive spaces, *l'espace potentielle*, “potential space” (Merleau-Ponty, 1962). D. W. Winnicott (1971) used the same term in relation to his thoughts on play and culture. Unlike other animals, human beings are able to inhabit fictional worlds, to turn away from the phenomenal present and imagine ourselves elsewhere. Rats, even sea snails, remember, but they don't actively recollect themselves as characters in the past or hurl themselves into imaginary futures.

How do we conceive the imagination now? From Galen in the second century, to Descartes and his pineal gland where he located *phantasie* or the imagination in the seventeenth, to phrenology in the nineteenth, and Freud's abandoned “Project” (1950 [1895]) near the dawn of the twentieth, thinkers have sought the anatomical sites of mental functions. We have not solved the mystery of the mind's eye, or what is now framed as a brain/mind problem. Terms such as neural representations, correlates, and substrates for psychological phenomena do not close the explanatory gap—they reveal it. There is a vast literature on this, and the debates are ferocious. A solution does not seem immanent. Suffice it to say that our inner subjective experience of mental images, thoughts, memories, and fantasies bears no resemblance to the objective realities of brain regions, synaptic connections, neurochemicals, and hormones, however closely they are connected.

I am not going to solve the psyche/soma problem here, but I can put some pressure on that old sentence of mine: *Writing fiction is like remembering what never happened*, or, to rephrase it, *How are remembering and imagining the same, and how are they different?*

The novelist, the psychoanalyst, and the neurosci-

entist inevitably regard memory and imagination from different perspectives. For the novelist, the story does all the work. When I am writing fiction, I am concerned with what *feels* right and *feels* wrong. I see images in my mind as I work, just as I do when I remember. Often I use landscapes, rooms, and streets that actually exist as backdrops for the actions of my fictional characters. I am directed by the story, by the creation of a narrative that resonates for me as *emotionally*, rather than literally, true. The novel develops an internal logic of its own, guided by my feelings.

For the analyst, a patient's personal memories are crucial, but so are fantasies and dreams. They exist within the dialogical atmosphere of the analytic room and the abstract conceptual framework the psychoanalyst brings to his work. When listening to a patient's memory, a psychoanalyst would keep in mind Freud's idea of *Nachträglichkeit*—what James Strachey translated as “deferred action.” The adult patient may have memories from when he was 5 years old, but those memories have been reconfigured over time. The analyst would be alert to repetitive themes and defenses in his patient's speech, but also voice cadences, hesitations, and, if his patient is looking at him, the motions and gestures of a body. What is created between analyst and patient is not necessarily a story that represents historical fact, but one that reconstructs a past into a narrative that makes sense of troubling emotions and neuroses. For patient and doctor, as for the novelist, the narrative must also be felt; it must resonate bodily as emotionally true.

The neuroscientist is trained to conceive of subjective memory and creative acts through objective categories, which she or he hopes will unveil the neurobiological realities of a self that both remembers and imagines. Following Endel Tulving and others, the neuroscientist will probably divide memory into three categories: (1) episodic memories (conscious personal recollections that can be localized to a specific place and time); (2) semantic memories (impersonal recall of information—cats have fur, Kierkegaard wrote under pseudonyms), and (3) procedural memories (unconscious learned abilities, such as riding a bike, reaching for a glass, typing) (Roediger & Craik, 1989; Tulving, 1984, 1993). As a memory researcher, the neuroscientist would be aware of Joseph LeDoux's work on the enduring synaptic connections formed by emotion in memory—fear in particular—and she or her would know that memories are not only consolidated in our brains, they are reconsolidated (Debiec & LeDoux, 2009; LeDoux, 2002; Nadar, Schafe, & LeDoux, 2000). Although it is unlikely that our neuroscientist has read Freud carefully, she or he would unwittingly agree

with him that there is no original “true” memory: autobiographical memories are subject to change. Finally, theoretically, at least, our neuroscientist’s subjective feelings are irrelevant to her or his work.

In these three practices, we find the two modes of human thought that William James in his essay “Brute and Human Intellect” called narrative thinking and reasoning (1992). Jerome Bruner, using a philosophical term, has called them two natural kinds—that is, essentially different (1986). Novelists think in stories. Analysts use both narrative thought and the categorical thinking of reasoning. Scientists may employ a case history as an illustration, but their work proceeds without story. Reasoning is sequential but is not dependent on a representation of time. Narrative is embedded in the temporal. Unlike the flux that characterizes narrative, scientific categories are static. Memory and imagination have to be approached from a third-person perspective and placed in a broader taxonomy. In the reasoning mode, definitions become all-important and therefore a frequent battleground. First-person experience is vital to narrative because there is always an agent whose subjectivity and intentionality are part of the story’s movement, narrated from one perspective or another. In science, the subject is nameless and normative.

What is the third-person point of view? Scientists cannot jump out of themselves and become God any more than the rest of us can. Through a largely unexamined agreement about what Thomas Kuhn in *The Structure of Scientific Revolutions* (1962) calls a paradigm—the bottom line of accepted theory, which changes over time, often in great convulsions—and an explicit consensus about methodology, scientists aim to avoid subjective bias. Freud’s idea of the neutral analyst is a direct importation from the natural sciences. The omniscient narrator in some novels plays this role as he looks down from on high at his characters and their follies, but we readers know that clever as he may be, Henry Fielding’s narrator in *Tom Jones* is not God. Indeed, the cool “I-less” voice of nearly all academic writing adopts the pose of the third person. There is an author or authors, but they vanish as persons from the text. Still, as Kuhn (1962) argues, there is no such thing as perceptual neutrality. The histories of science, psychoanalysis, and, of course, the novel make this abundantly clear. This truth does not impede either discovery or innovation; it merely qualifies epistemology.

As Augustine points out, if we didn’t have names and ideas for things, we couldn’t speak of them at all. Both the reasoning and narrative modes of thought create linguistic representations. They exist on what

the linguist Emile Benveniste (1971) refers to as a pronominal axis of discourse. The “I” implies a “you,” even if that “I” is just listening to one’s inner self. The language wars are as fierce as the brain/mind wars. Is there a universal grammar, as Noam Chomsky (1993) argued? Wasn’t Wittgenstein (1958) right that there is no such thing as a private language? How is language acquired, and exactly what does it have to do with our memories and imagination? There is no consensus. I am sympathetic to A. R. Luria’s position that the advent of language *reorders* the mental landscape (Luria, 1966). I do not subscribe to the postmodern notion that *it is* the mental landscape. Nevertheless, whatever innate abilities we may have to learn it, language, which is both outside and inside the subject, plays a crucial role in our reflective self-consciousness, in how we become creatures of not only “I remember,” but “What if . . . ?”

We codify perceptual experiences in conscious memory through both placement (where and when it happened) and interpretation (what it means in the larger context of our life). In our autobiographical memories, as in a mirror, we become others to ourselves. Even if we don’t see ourselves in the third person, we have projected the self elsewhere in time. As Merleau-Ponty notes in *The Phenomenology of Perception* (1962): “Between the self which analyzes perception and the self which perceives, there is always a distance” (p. 43). There is a difference, he argues, using Hegel’s distinction, between the “in itself” and the “for itself” [*für sich*]. When I actively recall something from my past, what Augustine called “will” is involved. This is exactly how Aristotle (1931) distinguished human from animal memory. Only we people *will* ourselves backward in time.

And the episodic memories we recall have mostly been turned into stories. If narrative is, as Paul Ricoeur argues in *Time and Narrative* (1984), a “grasping together” of various temporal actions or episodes in both life and fiction into a whole that has meaning, I believe that meaning is crucially grounded in emotion. It makes sense that narrative—a ubiquitous form of human thought—would, mimicking memory itself, focus on the meaningful and leave out the meaningless. What I am indifferent to I mostly forget. The stories of memory and fiction are also made by absences—all the material that is left out.

As early as 1895, the psychologists Alfred Binet and Victor Henri tested children’s memories for lists of unrelated words as opposed to meaningful paragraphs. The children remembered the meaningful passages far better, but they reported them back to their examiners in their own words (Kimble & Wertheimer, 1998).

They retained, to borrow a term from the Russian formalists, the *fabula*. Cinderella can be told in many different ways, and the details may vary, but the *fabula*, the bones of the story, remain the same. The narrative mode contextualizes the meaning or valence inherent in every emotion. It pulls together and makes sense of disparate sensory and affective elements.

Augustine's insight that emotion dims in memory, however, is overwhelmingly true of our episodic memories. The cooling of the emotions that belong to such recollections is built into the nature of this kind of memory, because it is quickly turned into narrative. The raw affective material of memories is restructured and then told as stories from a remove. Much, if not all, of this restructuring takes place unconsciously. When I remember, for example, that in 1982 I was hospitalized for eight days with an excruciating migraine that had lasted for many months, I do not re-experience either my pain or my emotional distress, although the pictures in my mind are colored gray for sadness.

I no longer remember what happened every day in the hospital, only a few highlights—a nurse who seemed to believe migraineurs were either neurotics or malingerers, the interns who asked me over and over who the president was, and my doctor who seemed exasperated that I didn't get well. (All of their facial features are now visually dim.) I remember lying in the hospital bed, but I no longer see the room clearly. Still, I have a mental image that probably combines several hospital rooms I've visited or seen in the movies. We deposit memorable emotional events into a visual setting that makes sense, but what we see in our minds may bear little resemblance to what actually was. What I have retained is the story and a few serviceable mental pictures, but much is missing from that verbal account.

The fact that I used that hospital stay in my first novel, *The Blindfold*, further complicates matters, because I turned an episode from my life into fiction, an episode that I had already, no doubt, fictionalized in memory (1992). Both the memory story and the novel were created unconsciously. Furthermore, I do not truly recall my 27-year-old self. Too much time has intervened. I can easily shift the scene and see myself in the third person, a wan, blonde young woman pumped full of thiorazine staring at the ceiling. The hospital chapter of *The Blindfold* was turned into a movie, *La Chambre des Magiciennes*, by the French filmmaker Claude Miller. My experiences in Mount Sinai in 1982 generated three stories with the same *fabula*: my own narrative memory of an actual event, my character's story in the novel based on that event, and my character's story in the film, embodied by the actress Anne Bro-

chet. Each one is different, and each one is constructed as a narrative, which partakes of the imaginary, the fictionalizing processes inherent to memories that are reflectively self-conscious.

Neuroscience research on the imagination is limited. However, a recent paper on patients with bilateral hippocampal lesions found they suffered from impaired imaginations as well as memory (Hassabis, Kumaran, Vann, & Maguire, 2007). A paper that same year by the same team published in the *Journal of Neuroscience*, "Using Imagination to Understand the Neural Basis of Episodic Memory," based on fMRI scans concludes: "we have demonstrated that a distributed brain network, including the hippocampus, is recruited during both episodic memory recall and the visualization of fictitious experiences" (Hassabis, Kumaran, & Maguire, 2007, p. 14365). The activated part of the brain is a large cortical network, which has been implicated in "high-level" cognitive functions, not only episodic memory, but future thinking, spatial navigation, theory of mind, and the default network. The participants were given three tasks that fell under the rubrics recall, recreate, and imagine. Notably, they were asked to keep all of these scenarios emotionally neutral.

The authors divided episodic memory into what they call "conceptual components," among them a sense of subjective time, narrative structure, and self-processing. Although I enthusiastically endorse such research and believe episodic memory and imagination are fundamentally connected, I would like to focus on just one of their components: self-processing. The authors hypothesize that there will be less self-processing in imaginary other-oriented scenarios than in autobiographical ones, a reasonable thought, until one asks oneself exactly what self-processing is. How exactly does an imaginary story I am generating about you, or her or him, not involve me? Aren't all of these narratives—recalled, recreated, or imagined—related to my self, a part of my subjective experience? Furthermore, aren't these narratives represented, at least in part, in language, and so necessarily located on the axis of discourse? There is no pronominal "I" without a "you." When I think of you, are you not a part of me? What is being processed here? Shouldn't neuroscience look to other disciplines to refine this vague idea: self-processing? Isn't phenomenology's concept of an embodied self useful in this regard? And what about psychoanalytic theory, with its internal objects, transference, and countertransference? Even with a cooling effect, can episodic memory and imagination really be entirely divorced from emotion?

In a comprehensive review of neuroimaging studies on self-processing versus other-processing in *Psycho-*

logical Review, Dorothee Legrand and Perrine Ruby (2009) state: “The authors of the aforementioned studies . . . hypothesized that a given cerebral substrate should be systematically more activated for the self than for the nonself. Our review demonstrates that the cerebral network they identified does not exhibit such a functional profile” (p. 258). I politely suggest that many of the researchers reviewed by Legrand and Ruby have lost themselves in the philosophical wilderness of selfhood. At the explicit representational level of episodic and imaginative narration, a distinction between self- and other-processing strikes me as entirely artificial.

In a fascinating paper, “Bodily Self: An Implicit Knowledge of What Is Explicitly Unknown,” Frassinetti, Ferri, Maini, and Gallese (2011) conducted two experiments to untangle the following question: “We directly compared implicit and explicit knowledge of bodily self to test the hypothesis that bodily self-advantage, i.e., facilitation in discriminating self compared to other people’s body effectors, is the expression of an implicit body-knowledge” (p. 159). In the first experiment, the subject was confronted with three photographs, one on top of the other, of his or her own and other people’s hands and feet, as well as objects (mobile phones and shoes) belonging to him/herself or others. The subjects were asked to match the lower or upper image to the center “target” photograph. In this task, a distinct self-advantage showed itself. In other words, people were considerably better at matching their own body parts than at matching other people’s. No such advantage was present with the objects. In the second experiment, there was no target image, just an empty white box in the center. This time, the subject was asked which of the two remaining images was his or her *own* hand, foot, mobile phone, or shoe. Not only was there no self-advantage in this case; there was a self-disadvantage in recognizing one’s own body parts, one that was not seen in the recognition of one’s own objects.

The hypothesis is that an unconscious motor representation of our bodies is at work in the first task, while what the authors call “body identity” must be summoned for the explicit task. Body identity—or what Shawn Gallagher in *How the Body Shapes the Mind* (2005) calls *body image*—is a conscious, not an unconscious, idea. It is the self perceived as an other. In the explicit task, the response is not automatic: the person has to think about it, and thinking often involves a linguistic construction as well as a visual one. Is that *my* foot? Is it someone else’s? The author’s conclusion is worth quoting: “Taken together, our results show for the first time that the representation of our body-

effectors is not only different from the way we represent inanimate objects, but—more importantly—it is accessible in a least two different ways: one way is implicit, while the other is detached, third-person like” (pp. 11–12). This unconscious/conscious distinction is paramount to understanding what neuroimagers call “self-processing.”

William James said that all personal memories have a “warmth and intimacy,” a quality of one’s own (1952, p. 299). To use the Latin word for selfhood or identity, my memories have *ipseity*. But so do my fantasies, the vicarious experiences I have while reading, my thoughts about others, my feelings about my fictional characters, and my dreams. James’s “warmth and intimacy,” that sense of ownership, is not emotionally neutral. And, as Freud stressed in *The Interpretation of Dreams*, however irrational or bizarre our dream plots may be, the emotions we feel are not fictional: “If I am afraid of robbers in a dream, the robbers, it is true, are imaginary—but the fear is real” (1900, p. 460).

While Proust’s tea-soaked bit of cake has become a facile reference for just about everybody, what is interesting is not that the petite madeleine opens the narrator to memories of his childhood, but, rather, that at first the taste produces *only feeling*: “this new sensation having had on me the effect which love has of filling me with a precious essence; or rather this precious essence was not in me, it was me” (1982, p. 48). It is only after the swell of high feeling has passed that Proust’s narrator asks himself this: “What did it mean?” That meaning, explored in the seven-volume, first-person narrative of *Remembrance of Things Past*, lies in the fluctuations of subjective experience—of an emotional self in space and time. First, the narrator perceives and feels. He is immersed in the prereflective consciousness of a sensual reality that is also somehow remembering. Only later does he reflect on it, and that reflection requires that he conceive of himself as an object to himself in the same way he conceives of others. Is it not reasonable, then, that “self-processing” cannot be distinguished from “other-processing” at the explicit, conscious level of storytelling?

The narrative self is the self in time. We are immersed in time, not clock time necessarily, although we adults refer to it, and certainly not the time of physics. We live in subjective time, the sequential time of our consciousness, and what happens before becomes the template for what we expect to happen later. Through repetition, past perceptions create future ones. In one of his 1925 lectures on phenomenological psychology, Edmund Husserl writes that “each . . . momentary perception is the nuclear phase of a continuity, a continuity of momentary gradated retentions on one side, and

a horizon of what is coming on the other side: a horizon of protention, which is disclosed to be characterized as a constantly graded coming” (quoted in Zahavi, 2008, p. 57). We are continually retaining and projecting, and the present always carries in it the thickness of before and after. Husserl, who was influenced by William James, argues that the experience of time, this perceptual stream, is always pre-given in a first-person perspective. When he was 5 years old, my nephew Ty sat in the family car and made a startling discovery. Looking at the road behind him, he cried out, “That’s the past!” Turning to the road ahead, he crowed, “That’s the future!” The locus of that streaming reality of time and space, was of course, Ty himself.

We now know that a form of time, or, rather, timing, is also part of infancy. Psychoanalysis, attachment studies, and infant researchers such as Daniel Stern (1985) have been vital to our notation of what might be called the intersubjective music of early life, the preverbal melodies of the first human interactions. As John Bowlby postulated, these rhythms of attachment are crucial to affect regulation later in life. In *Rhythms of Dialogue in Infancy* (Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001), an empirical study of adult–infant vocal interactions, the authors proceed from a dyadic view of early communications. The nuanced analysis of the rhythmic dialectic between mother and child provides a foundation for a child’s ongoing social and cognitive experiences by forming, as the authors put it, “temporal expectancies.” These bodily, emotional expectations form the ground for the axis of discourse and the narrative self. An infant’s prereflective conscious perceptions are not yet *for him/herself* in an articulated story. Nevertheless, these deeply established corporeal metrics, the sensorimotor beats of self and other, merge with genetic temperament in the dynamic synaptic growth that accompanies early emotional learning. In his book *Affective Neuroscience* (1988), Jaak Panksepp writes:

From a psychological perspective, I would say that the main thing that develops [in a child’s interactions with his world] in emotional development is the linking of internal affective values to new life experiences. However, in addition to the epigenetic processes related to each individual’s personal emotional experience leading to unique emotional habits and traits, there is also a spontaneous neurobiological unfolding of emotional and behavioral systems during childhood and adolescence. [p. 55]

We are creatures of a subjective time founded in the wordless dialogues of infancy, which is further developed in language and its natural consequence,

story. As important as the narrative self is, however, I am in complete concordance with Dan Zahavi, who writes in his book *Subjectivity and Selfhood* (2008), “Is it legitimate to reduce our selfhood to that which can be narrated?” He goes on to add, “The storyteller will inevitably impose an order on the life events that they did not possess while they were lived” (p. 112). Proust’s “precious essence,” which he claims is himself, resonates with Panksepp’s revision of Descartes’ famous *cogito ergo sum* to *I feel therefore I am*. Panksepp locates his core SELF in the brainstem: “the ability to experience raw affect,” he argues, “may be an essential antecedent to foresight, planning, and thereby willful intentionality” (2003, p. 204). I add narrative to that list. Antonio Damasio, in his new book *Self Comes to Mind* (2010), discusses his protoself that produces “primordial feelings,” which reflect the body’s homeostatic reality, “along the scale that ranges from pleasure to pain, and they originate at the level of the brainstem rather than the cerebral cortex. All feelings of emotion”, he continues, “are complex variations on primordial feelings” (p. 21).

In “Instincts and Their Vicissitudes” (1915), Freud proposed his own homeostatic model of primitive selfness in an organism that can discriminate between outside and inside through “the efficacy of its muscular activity.” For Freud, the regulation of internal drives and external stimuli is the origin of all feelings. “Even the most highly evolved mental apparatus,” he writes, “is automatically regulated by feelings belonging to the pleasure pain series” (p. 118). It is out of this core feeling self that a reflectively conscious, remembering, imagining narrative self develops.

Shaun Gallagher (2005) also posits a minimal self or a “primary embodied self” already present in the sensorimotor corporeal reality of an organism that is aware of its own boundaries (pp. 78–79). Infant studies on imitation and deferred imitation give credence to the idea that a newborn has a greater awareness of its separateness from others and the environment than was thought earlier (Jones & Herbert, 2006; Meltzoff & Brooks, 2007). Exactly how memory develops in babies is controversial. What effects do an immature hippocampus and forebrain and incomplete myelination have on that development? What exactly do implicit and explicit memory mean in a preverbal infant? What roles do imitation, mirroring, and language play (Pineda, 2009)? How do we frame the reality of infant consciousness? How is it related to a minimal or core self? When does *in itself* become *for itself*? What is the neurophysiology of time perception, and how does it develop (Eagleman et al., 2005)? All of these questions remain unanswered.

Narratives from the Crib, edited by Katherine Nelson (1989), focuses on the monologues of Emily Oster taped before she went to sleep between the ages of 21 and 36 months. These soliloquies are remarkable illustrations of what Vygotsky (1986) called private speech, the stage before inner speech takes over. We witness the chattering play-by-play announcer who has not yet gone underground. Here is a monologue from when Emily was 21 months old. She is talking to her doll. I have truncated it slightly.

Baby no in night
Cause baby crying
Baby no eat supper in in in this
No eat broccoli no
So my baby have dinner
Then baby get sick
Baby eat no dinner . . .
Broccoli carrots cause rice
Emmy eat no dinner
Broccoli soup cause
No baby sleeping
Baby sleeping all night

[p. 158]

There are no fixed tenses here that situate past, present, and future, no pronominal “I.” There is a third-person baby and a third-person Emmy, characters that mingle in what might be called a proto-narrative. Emily verbally represents herself as an agent to herself and describes a series of actions in order to make sense of her emotion: the memory of not feeling well, not eating, and not being able to sleep. The third-person “Emmy” precedes the first-person “I” because reflexive self-consciousness, “for-itself” reality, emerges from seeing herself as others see her, those vital others who recognize Emmy as an agent and actor in the world. In a later monologue, at 28 months, the little girl imagines herself in a fictional place, the future, to master her anxiety about what lies ahead. “We are gonna at at the ocean/ ocean is a little far away . . . / I think it is a couple of blocks away” (Nelson, 1989, p. 163). After an associative stream that includes a fridge submerged in water and a river, the child imagines sharks biting her. The fantasy is driven by emotion, but her speech allows the flowering of creative speculation while she is still safely in her crib, away from the sharks in her mind. Emily’s monologues are heavily analyzed in the book, but two points go unmentioned, perhaps because they are too obvious: having a narrator, external and voiced or internal and silent, is a way of keeping company with one’s self. In language, the self is always touched by otherness, if only because it is represented.

Some memories have no narrator and no time except the present. In 1961, when my cousin Nette was a year

old, she traveled to Africa with her parents and sister. Her father, my uncle, was a doctor who practiced in Bambuli in what was then Tanganyika. Nette learned Swahili, a language she later forgot. When she was 3 years old, she returned home to Norway with her family. Nette retained no conscious memories of Africa, but in 2007 she and her husband Mads visited Tanzania. As soon as she set foot in Bambuli, she was overwhelmed by sensations of familiarity. The smells, the colors, the sounds all contributed to a heady feeling that she had come home. One afternoon, Nette and Mads met some schoolgirls on the road, and although the two groups shared no common language, they communicated with smiles, laughter, and gestures. Mads suggested Nette hum a melody she remembered from childhood, a song the family had once sung together, the words of which had disappeared. When the girls heard the tune, they began to sing and, to her own amazement, Nette joined them. One after another, the lost Swahili lyrics returned to her, verse after verse, and Nette sang loudly and joyfully. In that moment of exuberant recall, forty-one years seemed to collapse. The 44-year old woman and the small child met.

This memory is not episodic, and although I have told it as a story, the recovery of the lyrics and the flood of joy my cousin experienced is not a narrative, but a form of involuntary memory. The nineteenth-century neurologist John Hughlings-Jackson called this kind of repetitive, learned knowledge *automatisms*. The automatism is proprioceptive, related to my bodily orientation in space, what Merleau-Ponty called a *body schema*, and it engages my sensorimotor capacities. The perceptual contexts—visual, auditory, and olfactory—acted as cues, and the once-learned but lost Swahili words came back automatically. Nette’s eruption of memory accompanied by a flood of joy has meaning *in itself*. Affect marks experience with *valence*, positive or negative, part of the pleasure–pain series. It is purely phenomenal and prereflective until we ask ourselves: What did it mean?

By far the most dramatic form of bodily prereflective, involuntary memory is the flashback. After a car accident, I had flashbacks four nights in a row that shocked me out of my sleep. Rigid, repetitious, horrifying, this memory was a visuo-sensorimotor re-experiencing of the crash. As the psychoanalysts Françoise Davoine and Max Gaudillière argue in their 2004 book *History Beyond Trauma*, this form of traumatic memory is outside time and language. It is not in the past. It is the kind of memory Augustine said nobody would *want* to have. The neurobiologists van der Kolk and Saporta (1993) make the same argument: “These experiences may then be encoded on a sensorimotor level without

proper localization in space and time. They therefore cannot be easily translated into symbolic language necessary for linguistic retrieval” (quoted in Brown, Schefflin, & Hammond, 1998, p. 94). Translation into words means location in space and time; it also means distancing and, perhaps ironically, greater mutability in memory. This very mutability, however, serves the cooling and creative aspects of narration, whether in memory or in fiction.

In *Beyond the Pleasure Principle* (1920), Freud cites Kant, for whom “time and space are ‘necessary forms of thought,’” and then goes on to say, “We have learnt that unconscious mental processes are in themselves ‘timeless’. This means in the first place that they are not ordered temporally, that time does not change them in any way and that the idea of time cannot be applied to them” (pp. 31–32). Unlike secondary process, what Freud called primary process does not distinguish past, present, and future. We glimpse this form of archaic thought in dreams, which are more concrete, emotional, and associative than waking thought, and in Emily’s early monologues, in which subjective time is not yet fully codified in language.

That creativity is mostly unconscious is hardly surprising. Psychoanalysis has long known that we are strangers to ourselves, and the idea of unconscious perception has been with us at least since Leibniz in the seventeenth century. All creativity in both modes of thought—reasoning and narrative—can be traced to this timeless dimension of human experience or, I would say, a dimension with sensorimotor timing, but not self-reflective time. In a letter to Jacques Hadamard, Albert Einstein wrote that neither language nor “any other kinds of signs which can be communicated to others” were important features of his thought. His work, he said, was the result of “associative play,” was “visual and motor” in character, and had an “emotional basis” (quoted in Ghiselin, 1952, p. 32). In 1915, Henri Poincaré, the great mathematician, pointed to the unconscious origins of his own work:

The subliminal self plays an important role in mathematical creation . . . we have seen that mathematical work is not simply mechanical, that it could not be done by a machine, however perfect. It is not merely a question of applying rules, of making the most combinations possible according to fixed laws. The combinations so obtained would be exceedingly numerous, useless and cumbersome. [quoted in Ghiselin, 1952, p. 28]

Every once in a while a formula, a poem, an essay, a novel bursts forth as in a waking dream. The poet Czeslaw Milosz once said: “Frankly all my life I have

been in the power of a daimonion, and how the poems dictated by him came into being, I do not quite understand” (quoted in Bruner, 1986, p. 3). William Blake said his poem “Milton” “was written from immediate dictation . . . without premeditation and sometimes against my will” (quoted in Kelly & Kelly, 2007, p. 445). Nietzsche described thoughts that came to him like bolts of lightning: “I never had any choice about it” (quoted in Bertram & Norton, 2009, p. 198). The last pages of my novel *The Sorrows of an American* (2008) were written in a trance. They seemed to write themselves. Such revelations may well be based on years of laborious living, reading, learning, and cogitating, but they come as revelations nevertheless.

A retreat to nineteenth-century science is needed to frame this creative phenomenon. F. W. H. Myers was a renowned psychical researcher and a friend of William James, who is now mostly forgotten. His magnum opus was called *Human Personality and Its Survival of Bodily Death* (1907), a title that no doubt hastened his oblivion. Still, he was a sophisticated thinker who applied the idea of automatism to creativity. Unlike Jackson’s habitual automatism or the pathological dissociations of hysteria studied by Pierre Janet or Freud’s idea of sublimation, Myers argued that subliminally generated material could suddenly find its way into consciousness, and that this eruption was not necessarily the product of hysteria, neurosis, or any other mental illness (Kelly & Kelly, 2007).

The definition of creativity in neuroscience research I have stumbled over again and again is: “the production of something novel and useful within a given social context” (Jung et al., 2009, p. 5319, 2010, p. 398; Aldous, 2007, p. 177). Useful? Was Emily Dickinson’s work considered useful? Within her given social context, her radical, blazingly innovative poems had no place. Is it useful now? This research definition must be creativity understood in the corporate terms of late capitalism. Another component of creativity featured in these studies is divergent thinking. In one study, subjects’ brains were scanned as they “produced multiple solutions to target problems” (Jung et al., 2009, p. 5319). The more solutions, the more creativity, but this is obtuse, as Poincaré pointed out so succinctly. We are not machines or computers but embodied beings guided by a vast unconscious and felt emotions.

I have often asked myself, why tell one fictional story and not another? Theoretically, a novelist can write about anything, but doesn’t. It is as if the *fabula* is already there waiting and must be laboriously unearthed or suddenly unleashed from memory. That process is not exclusively the result of so-called higher cognition; it is not purely cognitive or linguistic. When I write, I

see images in my mind, and I feel the rhythms of my sentences, embodied temporal expectancies, and I am guided by gut feelings of rightness and wrongness, feelings not unlike what has happened to me in psychotherapy as a patient. After my analyst's interpretation, I have felt a jolt of recognition, which is never merely an intellectualization but always has a felt meaning: *Oh my God, that's true, and if it's true, I have to rewrite my story.*

Fictions are born of the same faculty that transmutes experience into the narratives we remember explicitly but which are formed unconsciously. Like episodic memories and dreams, fiction reinvents deeply emotional material into meaningful stories, even though in the novel, characters and plots are not necessarily anchored in actual events. And we do not have to be Cartesian dualists to think of imagination as a bridge between a timeless core sensorimotor affective self and the fully self-conscious, reasoning, and/or narrating linguistic cultural self, rooted in the subjective–inter-subjective realities of time and space. Writing fiction, creating an imaginary world, is, it seems, rather like remembering what never happened.

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Embodied Simulation Theory: Imagination and Narrative

Commentary by Vittorio Gallese (Italy)

The timely and thought-provoking essay by Siri Hustvedt provides a fascinating account of the relationship between imagination and memory and discusses this relationship against the background of different disciplines like psychoanalysis, cognitive neuroscience, and phenomenology. Hustvedt sheds new light from the inside on the process of artistic creativity by emphasizing that the bodily affective self is at the roots of the narrative self. In the present commentary, I present and briefly discuss recent scientific results corroborating Hustvedt's thesis and propose how embodied simulation theory can account for many aspects of the relationship between artistic production and its aesthetic experience.

Keywords: aesthetic experience; embodied narratology; embodied simulation; imagination; mirror neurons

The fascinating paper by Siri Hustvedt addresses a crucial problem for a variety of disciplines like psychoanalysis, neuroscience, and narratology. This problem

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deals with the relationship between imagination and memory. The thesis put forward by Hustvedt is that memory and imagination partake of the same mental process, since they are both bound with emotion and often assume the form of narrative. Capitalizing upon Augustine, Vico, and Merleu-Ponty, Hustvedt convinc-

ingly argues that both memory and imagination are embodied. She aptly reviews how memory and imagination might be conceived for and treated by novelists, psychoanalysts, and neuroscientists, showing that their epistemology and henceforth their approaches—and conclusions—are different.

However, a common feature of memory and imagination is their emotional contour, a contour that resurfaces even when memory and imagination are reordered within a narrative structure. Hustvedt concludes her essay by stressing how novel writing—but one could easily apply her conclusions to any form of artistic creativity—stems from the same faculty that “transmutes experience into the narratives we remember explicitly, but which are formed unconsciously.” Fiction consists of the re-elaboration of unconscious memories together with their emotional tones and of their translation into a meaningful narrative. This means that creating an imaginary world would be equivalent to remembering what never happened.

In the present commentary, I focus on the relationship between fiction and imagination viewed first and foremost from the point of view of embodied simulation theory (Gallese, 2001, 2003, 2005, 2009, 2011). It has been proposed that our brain–body systems are equipped with a pre-rational, nonintrospective process—embodied simulation—generating a physical, and not simply “mental,” experience of the mind, motor intentions, emotions, sensations, and lived experiences of other people, even when narrated. Such physical experience can be described as Feeling of Body (FoB; see Wojciewski & Gallese, in press). Capitalizing upon what we are currently learning on intersubjectivity by means of the neuroscientific approach, I posit that the narrative reconstruction of real or imaginary life events, such as those characterizing fiction as we read it in novels, or the relationship between patient and analyst within the psychoanalytic setting, can be approached by an embodied narratology.

Embodied simulation and the world of others

In the second half of last century more and more scholars from different disciplines emphasized the role played by the body in our cognitive life. In 1987, the cognitive linguist George Lakoff wrote: “Thought is embodied, that is, the structures used to put together our conceptual systems grow out of bodily experience and make sense in terms of it; moreover, the core of our conceptual systems is directly grounded in perception, body movements, and experience of a physical and social character” (p. xiv). Such a statement doesn’t

sound particularly new to psychoanalysis, since one of the cornerstone upon which Freud built his theory is the body. In *The Ego and the Id* (1923), Freud wrote that “The Ego is first and foremost a body-ego” (p. 26). Lakoff’s embodied take on the human mind anticipated what cognitive neuroscience was about to discover just few years later.

Among such discoveries is that of mirror neurons in the macaque monkey premotor cortex and the ensuing research showing the presence of a similar mirror mechanism in the human brain. The mirror mechanism maps the sensory description of others’ actions, emotions, and sensations onto the perceiver’s own motor, visceromotor, and somatosensory representations of those actions, emotions, and sensations (Gallese et al., 2011). It has been proposed that such mapping enables one to perceive others’ actions, emotions, and sensations as if performing those same actions or experiencing those same emotions and sensations. Embodied simulation (ES) theory is an attempt to provide a coherent theoretical framework to these neuroscientific findings (Gallese, 2003, 2005, 2007; Gallese & Sinigaglia, 2011).

According to ES theory, individuals reuse their own mental states or processes in functionally attributing them to others (Gallese, 2009, 2011; Gallese & Sinigaglia, 2011). The extent and reliability of such reuse and functional attribution depend on the simulator’s repertoire and its being shared with the target’s repertoire. Brain and cognitive resources typically used for one purpose are reused for another purpose. For example, witnessing someone else expressing a given emotion (e.g., disgust, pain) or undergoing a given sensation (e.g., touch) recruits some of the visceromotor (e.g., anterior insula) and sensorimotor (e.g., second somatosensory area, SII; ventral premotor cortex) brain areas activated when one experiences the same emotion (Botvinick et al., 2005; Jackson, Meltzoff, & Decety, 2005; Wickers et al., 2003) or sensation (Blakemore, Bristow, Bird, Frith, & Ward, 2005; Ebisch et al., 2008; Keyzers et al., 2004), respectively. Other cortical regions, though, are exclusively recruited for one’s own and not for others’ emotions (Jabbi, Bastiaansen, & Keyzers, 2008), or are activated for one’s own tactile sensation, but they are actually deactivated when observing someone else being touched (Ebisch et al., 2011).

ES is mainly intrapersonal—that is, it pertains to the mental states or processes that an individual undergoes both when planning actions or experiencing emotions and sensations and when observing someone else’s actions, emotions, and sensations. A further distinguishing element of ES is its bodily format.

Mental representations can differ not only for their content, but also for their format. According to the classic mind-reading cognitive account, a given action, emotion, or sensation is mentally represented with a propositional format. ES theory complements this view by holding that the actions, emotions, and sensations of others can also be mentally represented with a bodily format.

ES theory holds that one way of making sense of others' behaviors consists of mapping these behaviors by reusing mental states and processes involving representations that have a bodily format. The reuse of our neural and cognitive resources is a constitutive part of our perception and making sense of others. Thus, by enabling the functional attribution to others of mental states or processes in bodily format, ES can play an important constitutive role in mind-reading. The novelty of this approach consists in conceiving of mind-reading as not necessarily and exclusively requiring the explicit attribution of mental representations in propositional format. If this is true, a substantial aspect of intersubjectivity can be conceived of as mainly dependent upon intercorporeity.

A further interesting recent contribution of cognitive neuroscience is the discovery that when we read or listen to narratives we literally embody them by activating a substantial part of our sensorimotor system (for review, see Glenberg & Gallese, 2011; Pulvermüller, 2005). The activation of motor representations in the brain of the reader or listener has been demonstrated at the phono-articulatory level, as well as during the processing of action-related linguistic expressions (words and sentences) and of morpho-syntactical aspects of language. This evidence, although widely discussed, points to a causal role of ES in language processing and understanding.

The import of such evidence for psychoanalysis—the “talking cure”—should be obvious. As Freud wrote in his monograph on aphasia, a word “acquires its *meaning* by being linked to an ‘object-presentation’. . . . The object-presentation itself is . . . a complex of associations made up of the greatest variety of visual, acoustic, tactile, kinaesthetic, and other presentations” (1915, Appendix C, p. 213). As recently pointed out by the psychoanalyst Ana-Maria Rizzuto, the analyst’s intention to fully listen to the patient as a “total self” (2008, p. 746) relies upon the patient’s prosody and the emotional history of the employed words.

The late Italian psychoanalyst and neuroscientist Mauro Mancía repeatedly emphasized the relevance of the affective bodily quality of communication within the analytic relation. According to Mancía (2006), to fully grasp the total dimension of transference one can-

not neglect the infraverbal components of communication between patient and analyst. These components, according to Mancía “include the rhythm, tone, timbre and musicality of a sentence, as well as the syntax and tempi of speech. All this constitutes, in the analytic encounter, the ‘musical dimension’ of the transference” (2006, p. 91).

As Hustvedt aptly points out, the research of Daniel Stern (1985) has revealed “the intersubjective music of early life, the preverbal melodies of the first human interactions.” These emotional spatiotemporal contours, these “forms of vitality” (Stern, 2010), do not exclusively characterize early life, but continue to guide our experience of the many realities we encounter and of our interpersonal relations. Hence, the relationship between analyst and patient with its transference dimensions can be viewed, studied, and discussed from a bodily perspective. Cognitive neuroscience and ES theory can shed new light not only on the implicit, preverbal aspects of psychoanalytic interpersonal dynamics, but also on the language-mediated ones.

Imagination, the world of fiction, and its experience: *liberated* embodied simulation

The mirror mechanism is one instantiation of ES: the simulation process is triggered by a perception, as when observing someone performing an action, expressing an emotion, or undergoing a somatosensory stimulation. However, embodied simulation can also occur when we *imagine* doing or perceiving something. When we imagine a visual scene, we activate the same cortical visual areas of our brain normally active when we do perceive the same visual scene. Similarly, mental motor imagery and real action both activate a common network of cortical and subcortical motor centers such as the primary motor cortex, the premotor cortex, the supplementary motor area (SMA), the basal ganglia, and the cerebellum (for review, see Wojciewowski & Gallese, in press). Thus, visual and motor mental imagery are not exclusively symbolic and propositional. They both rely on and depend upon the activation of sensorimotor brain regions. Visual imagery is somehow equivalent to simulating an actual visual experience, and motor imagery is somehow equivalent to simulating an actual motor experience. In other words, motor and visual imagery do qualify as further forms of ES. When indulging in visual or mental motor imagery, we reuse our visual or motor neural apparatus to imagine things and situations we are not actually perceiving or doing.

If viewed from a neuroscientific perspective, the border separating real and fictional worlds appears thus much less sharp and clear than what humans thought for centuries. This aspect is particularly interesting when referred to artistic creativity and its fruition. The artist through her imaginative creativity gives birth to a fictional world that not only shares many features with the real one, but also some of the underpinning neural processes. Our relationship with fictional worlds is double-edged: on the one hand, we pretend them to be true, while, on the other, we are fully aware they are not. Suppose you enter an art museum and head toward your beloved Cezanne. A powerful multiple framing effect is at work here: you are in a special context, an art museum, where the images hanging on the wall are supposedly all art works. You behold the painting, one of the many versions Cezanne painted of Montagne St. Victoire, immerse yourself into it, leaving its surrounding frame behind. But the frame is still fully present—both physically and metaphorically—at the periphery of your visual field. You see the painted mountain and simultaneously relate it to the real mountain. As the Italian philosopher Alfonso Iacono put it, you are experiencing a sort of “tail of the eye” vision, which, according to him, characterizes all of our relationships with the “intermediate worlds” of fiction (Iacono, 2005, 2010). Capitalizing upon William James, Gregory Bateson, and Donald Winnicott, Iacono stresses that our appreciation of art means to inhabit intermediate worlds where territory and map do overlap. As he writes, “It can happen in dreams, in *trompe-l’oeil*, at the theater, at the cinema, in reading, in virtual reality, in stadiums during concerts or sport events. One enters the picture through the frame forgetting about having entered. This process, which takes place while being in an emotional state and which can be ritualized (actually it is necessary for rituals), is at the origin of the process of naturalization – that is, that process that makes the artificial, historical and changeable events appear natural, eternal and unmodifiable” (2010, p. 84).

In spite of the fact that at the core of our perceptions, of our understanding and of our imagination is the body, the relationship with fictional worlds is still mainly explained, following Coleridge, in terms of “suspension of disbelief”—that is, in purely cognitive terms.

I always found this explanation overly reductive and, at best, partial. Furthermore, it betrays the diffident attitude displayed by some quarters of classic cognitivism and analytic philosophy toward literature and fiction narratives. As (incredibly) argued by Hilary Putnam (1976), “The Greek dramatists, Freudian

psychology, and the Russian novel are all supposed . . . to embody knowledge-knowledge about man. . . . No matter how profound the psychological insights of a novelist may seem to be, they cannot be called knowledge if they have not been tested” (pp. 487–488).

Is suspension of disbelief all there is in our relationship with the intermediate worlds of fiction? I suspect not. It has been proposed (Wojciehowski & Gallese, in press) that ES can be relevant to our experience of fictional worlds, like those narrated in novels, for two reasons: First, because of the FoB evoked by narrated characters and situations with whom we identify by means of the mirroring mechanisms they activate; in such a way, ES generates the peculiar attitude informing our aesthetic experience. Second, because of the bodily memories and imaginative associations the narrated material can awake in our readers’ minds, without the need to reflect upon them explicitly.

Furthermore, there is a context-dependent aspect characterizing our relationship to narrated stories, both when we read them in novels and when we tell them or listen to them within the psychoanalytic setting. This aspect deals with our distancing from the unrelated external world, which remains at the periphery of our attentional focus, very much like the frame surrounding Cezanne’s painting. Such distancing, this temporary suspension of the factive grip on our daily occupations, liberates new simulative energies. Our experience of narratives, more than a suspension of disbelief, can be thus interpreted as a sort of “liberated embodied simulation.” When we relate to a narrated story (but also when attending a theatrical play or a movie), our ES becomes liberated—that is, it is freed from the burden of modeling our actual presence in daily life (Gallese, 2010; Wojciehowski & Gallese, in press). Through an immersive state in which our attention is focused on the narrated virtual world, we can fully deploy our simulative resources, letting our defensive guard against daily reality slip for a while.

Finally, it should be added that the contextual bodily framing normally accompanying our reading of a novel—our being still—additionally boosts our ES. When reading, we not only entirely focus our attention on the literary work, but our being still simultaneously enables us to fully deploy our ES resources at the service of the immersive relationship with the narrated characters, thus generating a powerful feeling of body. The particularly moving experience generated by reading novels is thus likely also driven by this sense of safe intimacy with a world we not only imagine, but also literally embody.

In conclusion, I enormously enjoyed reading this paper since it offers multiple stimuli to neuroscience,

to psychoanalysis, and to the dialogue between these disciplines, which I personally see as timely and potentially fruitful for both disciplines. Hustvedt's paper implicitly suggests that both neuroscience and psychoanalysis can converge when dealing with the world of fiction, in that they both envisage the body as the common playground for imagination. I fully agree and think that this is a very interesting topic that cognitive neuroscience should thoroughly investigate.

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Neuropsychanalysis, Consciousness, and Creativity

Commentary by Richard J. Kessler (New York)

Siri Hustvedt's work illustrates how psychoanalysis offers unique and crucially important insights in the study of fundamental issues in human psychology such as those of memory, perception, subjectivity, and creativity. Her findings dovetail with Freud's concepts of hallucinatory wish-fulfilment and primary process (as further elaborated by psychoanalysts Pinchas Noy and Barry Opatow). The findings also find resonance in a variety of neuroscientific fields of research, especially in studies of theta rhythm and its role in dreaming, memory, and early mental development, the relationship between hallucination and perception, and the brain research of Rodolfo Llinas.

Keywords: hallucinatory wish-fulfilment, hallucination, primary process, sensory feedback, theta rhythm

“Three Emotional Stories” is a multifaceted essay, learned, rich, and wise. Siri Hustvedt's remarks about being an outsider to the field of psychoanalysis are significant. Outsiders often bring fresh insights and appreciation of psychoanalysis. Indeed, she has identified and explored some of the most profound and unique of psychoanalytic discoveries.

I was inspired by her work in a particular way because at the time of my reviewing her paper I was reading a novel, Stephen Crane's 1895 *Red Badge of Courage*. I found myself rereading a particular passage that occurs in the following setting: Our hero, Henry Fleming, has just deserted his regiment after his first taste of battle at Chancellorsville in the American Civil War. He is wandering in the forest at the periphery of the fighting that is still raging and is looking upon a scene of blue columns of stout and strong Union soldiers rushing to the fray.

The passage is as follows:

He wondered what those men had eaten that they could be in such haste to force their way to grim chances with death. As he watched, his envy grew until he thought that he wished to change lives with one of them. He would have liked to have used a tremendous force, he said, throw off himself and become a better. Swift pictures of himself, apart, yet in himself, came to him—a blue desperate figure leading lurid charges with one knee forward and a broken blade high—a blue, determined figure standing before a crimson and steel assault, getting calmly killed on a high place before the eyes of all. He thought of the magnificent pathos of his dead body.

These thoughts uplifted him. He felt the quiver of war desire. In his ears he heard the ring of victory. He knew the frenzy of a rapid successful charge. The music of the trampling feet, the sharp voices, the clanking

arms of the column near him made him roar on the red wings of war. For a few moments he was sublime.

He thought that he was about to start for the front. Indeed, he saw a picture of himself, dust-stained, haggard, panting, flying to the front at the proper moment to seize and throttle the dark, leering witch of calamity.

Then the difficulties of the thing began to drag at him. He hesitated, balancing awkwardly on one foot. He had no rifle, he could not fight with his hands . . . His courage expended itself . . . [p. 64]

For me, this vignette captures some of what Siri Hustvedt has suggested about memory, perception, subjectivity, and creativity. I would like to use it to amplify some of these subjects from a neuropsychanalytic perspective.

First, regarding her criticisms of so-called self-processing research that there is no “I” without a “you,” surely the converse applies as well—namely, that there is no “you” without an “I.” For example, after all what is the source of Henry's perception of the other soldiers but his own shameful memory of his desertion? We are reminded of Freud's (1891) declaration in *On Aphasia* that perception and association (to previous experiences) cannot be separated because they are part of the same process. In this, Freud was declaring that knowledge in the brain—and therefore in the mind—is intrinsically self-referential. Our experiences acquire meaning by virtue of memories of previous experiences. Past and present are inextricably intertwined. As Hustvedt stated, “what happens before becomes the template for what we expect to happen later.” In the same spirit, Henry Head (1926), the famous English neurologist, described brain activity as a “march of events with a definite temporal relation; the response obtained from any one point, at a particular moment, depends on what has happened before” (p. 434). This relates to a simple conclusion most modern neuroscientists from Kan-

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del (1979) to Llinas (2001) have reached—namely, that brains and, in fact, all nervous systems evolved as predictors, as creators of inner *narratives* of future events, for the purpose of safe navigation of the environment.

However, Henry's experience goes beyond narration. His masochistic fantasy is of a hallucinatory or near-hallucinatory nature and, as such, a disturbance in reality testing. Can neuropsychanalysis help us to understand such a change in his subjective experience?

Consonant with the notion of brains as predictors is the finding from a multisite fMRI study of adult schizophrenic patients that hallucinations are "anticipated sensory experiences" (Ford et al., 2009). But since Hustvedt asks questions about infant consciousness and memory, we are led to recall that Freud postulated consciousness as *initially* experienced as hallucination, as in dreaming and hallucinatory wish-fulfillment. It is only over time and brain maturation that the objectivity of perception is learned, perceptions distinguished from memories, the past distinguished from the present, and the brain's predictions based on experience rather than wish.

But does this hallucination/consciousness model continue to operate in adult life, and is our perception of the external world a projection, from memory, of our internal world?

In *Totem and Taboo*, Freud (1912–13) describes the external world as being largely built up by the projection of sense perceptions as well as internal perceptions of emotions and thought processes. Barry Opatow (1997) carries this further. He describes the ever-active hallucinatory wish as "the mind, through purely internal operations generating an experienced reality. . . . And what mentality is under consciousness? A structural base that will not stay still. A striving towards hallucination dynamically intercepted and infused into the flow of awareness, penetrating and interweaving with consciousness to be partially realized in the external world" (pp. 884–885).

V. S. Ramachandran (2004), whom Hustvedt (2004) references in an essay, has stated, "In a sense we are hallucinating all the time. What we call normal vision is our selecting the hallucination that best fits reality." And Rodolfo Llinas (2001), whom Hustvedt has also referred to in that same essay, concurs: the brain is a reality emulator not a translator. It generates a continuous mental movie of the external environment. "We are basically dreaming machines that construct virtual models of the real world."

So the brain is, in a way, an ever-present movie-maker/storyteller.

Let's get back to Henry Fleming again. Note that it is sensory input (his awkward footing and empty handedness) that puts an end to his hallucinatory reverie, the outside world abruptly intruding on his internal movie-making.

This feedback mechanism is the essence of reality testing. This is how hallucinatory wish becomes thought, which Freud (1900) described as "merely constituting a roundabout path to wish-fulfillment which has been made necessary by experience" (p. 565). Constructed from experience, the secondary process restrains the primary process. External reality constrains psychic reality. Again, Llinas (2001) would agree. He sees sensory input from the environment as the modulator, the editor, so to speak, of an internally generated world that he refers to as *content* as opposed to *context*. It is private, closed, and subjective. R. P. Behrendt (2003), a researcher of thalamic sensory transmission, has made clear that "what we perceive is the product of an intrinsic process and not part of external physical reality" (p. 413). Furthermore, he states that "hallucinations, dream imagery and normal perception in wakefulness can be seen as forms of externalized conscious experience that are fundamentally equivalent in that they represent subjective creations projected externally, but that differ in the degree to which they are constrained by external reality" (Behrendt, 2006, p. 356).

This takes me to Hustvedt's comments about creativity, which she correctly views as residing not in the so-called higher cognitive processes, but in "dream-like reconfigurations of emotional meanings that take place unconsciously." Neuroscience would seem to have plenty to say about this.

But first let me offer Pinchas Noy's (1969) definition of the source of creativity, the primary processes, because it provides a bridge to the neuroscientific research. To him the primary processes represent the organization of input (perception) and storage (memory) according to basic drives, affective state, the sensory qualities of objects, the function of objects, and the self that is not *subject to feedback*, the flow of perceptual information that serves to regulate and monitor a given function—Henry Fleming without the sensory information from his foot and hand.

If this definition is valid, then dreaming must be the key, a state of the mind/brain, wherein perception is entirely dissociated from motility (and external stimuli), making it an ideal state for the development of imagery, thought, and imagination. This takes us again back to Llinas (2001). Dreams, he says, are cognitive states that are not modulated by sensory information; they are based totally on past experience. According

to him, in dreams we are released from the tyranny of sensory input. We can create possible worlds.

A variety of research findings seem to illustrate how a shift toward a dominance of certain internally generated processes, reminiscent of dreams, occurring at the same time as a diminution of sensory input appears to be essential to creative activity.

Neuroimaging studies demonstrate that brain regions recruited for spontaneous/creative thought overlap with those recruited during goal-directed thought (Christoff, Ream, & Gabrieli, 2004), but spontaneous/creative thought also competes with goal-directed thought (Teasdale et al., 1995). It shares functions and mechanisms not only with other forms of thought but with *sleep-related* cognition (Christoff, Gordon, & Smith, 2010). Spontaneous thought (off-line processing) recruits the “default network”: medial frontal cortex, anterior and posterior cingulate, precuneus, posterior parietal lobe, and memory processing in the temporal lobe (Raichle et al., 2001; Schulman et al., 1997)

This so called default network is activated when attentional demands diminish. It is associated with the kind of memory consolidation that occurs during *sleep* (Ellenbogen, Hu, Payne, Titone, & Walker, 2007). Its regions are more active prior to the presentation of “remote associates” tests before they are subsequently solved by insight (Kuonios et al., 2006), just as when creative stories are generated from lists of unrelated words (Howard-Jones, Blakemore, Samuel, Summers, & Claxton, 2005). In addition, reductions in beta power (15–25 Hz), which is correlated with diminished attentional processes, predict transformative insightful solutions (Sheth, Sandkuhler, & Bhattacharya, 2008). And finally, REM vs. quiet rest or NREM improves creativity by promoting the formation of new associations (Cai, Sarnoff, Harrison, Kanady, & Mednick, 2009).

The study of hippocampal theta waves, which Jaak Panksepp (personal communication 2011) has stated to be the most reliable biological marker of the SEEKING system, would seem to represent another span on the psychoanalysis/neuroscience bridge. Furthermore, research in this area seems to offer support for one of Freud’s (1950 [1892–1899]) most remarkable speculations: that it is from the contrasting pairings of reality and wish-fulfillment that mental life springs.

Robin Carhart-Harris (2007) has described the neurophysiology of several dreamlike states in which hallucinations predominate: psychosis, psychedelic states, temporal lobe epilepsy, and temporal lobe stimulation. Like REM sleep, they are characterized by bursts of theta and slow-wave activity in medial temporal

regions, part of what he refers to as pontine–geniculate–occipital limbic bursts. He relates this neurophysiologic state to an upsurge of unconscious material into consciousness. Recall that Hustvedt described writing the last pages of a novel as if in a trance.

Besides REM sleep and other dreamlike states, theta is correlated with hypnagogic/hypnopompic states and states of sensory deprivation, all conditions with a diminished stream of information from the outside world—in other words without sensory feedback, the stuff of reality testing. However, particularly robust, well-differentiated and rhythmical theta (hippocampal and cortical) is first generated during nursing, as demonstrated by Lehtonen et al. (2006). The behavioral concomitant to this EEG wave is described as internally directed, sustained, or controlled attention. Is this a correlate of hallucinatory wish fulfillment? Is the experience of nursing the first “day residue”.

Theta is also seen in *social contingency* situations, such as during a peek-a-boo game. Bursts of theta can be detected not when the face is first seen or when it reappears, but when the baby is anticipating the return of the face (Stroganova, Orekhova, & Posikera, 1998). In other words, theta appears to correspond to the remembering (hallucinating) of the hidden face.

But a more startling finding is that of Bazhenova, Stroganova, Doussard-Roosevelt, Posikera, and Porges (2007). Her laboratory was able to detect a triad of physiologic responses in 5-month-olds to the appearance of a smiling face: positive affect, respiratory arrhythmia, and a burst of theta. In contrast, an initial response to a blank face showed, primarily, signs of negative affect and a turning away. However, after repeated trials using a blank face, the baby eventually develops the same response as it did originally to the smiling face—namely, positive affect, respiratory arrhythmia, and theta rhythm. In fact, this ability to create a positive response to a blank face gradually develops over the first year of life.

Bazhenova et al.’s paper suggests that prefrontal theta activation might represent internally controlled sustained attention and an attempt at evoking reciprocity. Theta rhythm is said to be generated in hippocampal–neocortical circuitry when information important to the species is to be gathered in the environment (Miller, 1991). What could be more important for the human infant than a secure attachment to its caretaker? Moreover, Bazhenova et al.’s findings suggest that such experiences of interactive mismatch potentiate mental development.

“That face made me feel bad. I remember (hallucinate) a face that made me feel good. Remembering (hallucinating) that face doesn’t make me feel good.

Will my smiling bring the smiling face back and make me feel good?" Is that when and how storytelling begins?

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