CONSCIOUSNESS PERFORMED

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CONSCIOUSNESS LOST

> *"What ho! my lord! –*
> *My lord, I say! Othello!"*

When Iago suddenly realizes that Othello has become unresponsive, he knows exactly what has happened:

> *"My lord is fall'n into an epilepsy.*
> *This is his second fit; he had one yesterday."*

He also knows that it would not be helpful to rub Othello about the temples because: "The lethargy must have its quiet course" (Othello, act 4, scene 1). He may be a villain, but Iago knows the patient, his conscious and his unconscious states very well. But the stage is not a hospital. In real life, physicians and neurologists do not know the patients whose consciousness they must assess in the emergency room. They do know, however, that patients may not be completely unconscious during an epileptic seizure. Instead, they may be alert but unable to communicate, or unable to say who or where they are because they cannot remember. Things become further complicated when the patient's consciousness must be evaluated in situations in which questions are consecutively posed to the left and right brain hemispheres. This happens during the "Wada-test," an examination that is sometimes necessary for presurgical evaluations of patients who suffer from medically intractable epilepsies but who may be cured by epilepsy surgery. In the "Wada-test," each hemisphere of the brain is anesthetized consecutively to test the language and memory capacities of the contralateral, awake hemisphere. If both hemispheres of the brain can communicate, each may answer differently. This can also happen during examinations of split-brain patients in whom the fiber system that connects both hemispheres—the corpus callosum—was dissected to treat otherwise intractable seizures. Such patients may be able to point with their left hand to an object that only their right hemisphere can see. When asked which object has been shown in the visual field of the right hemisphere, however, the patient's left hemisphere may just confabulate balderdash (see Gazzaniga MS 2000). There are certainly verbal reports that are indicative of consciousness, and fortunately, these are the verbal reports we deal with every day. It does seem, however, that not all reports can readily be taken as proof of "normal" consciousness. With so many caveats, it is necessary to ask whether there is just one kind of consciousness that can be impaired or whether there might be different forms of consciousness.

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CONSCIOUSNESS DECLARED

Patients who have lost the ability to talk, write, understand, or read are aware of their impairment. The same is true for patients who are blind in one eye due to a lesion of the optic nerve. By contrast, there are patients who went blind due to lesions to their visual centers in the occipital lobes but are not aware of their loss, a neuropsychological condition called "anosognosia". Many lesion studies in patients with localized damage to certain parts of their cortices that cause circumscribed neurological or neuropsychological deficits have shown indisputably that the human brain is not an all-purpose problem-solving machine. Rather, it consists of multiple special-purpose modules—or "organs" as Steven Pinker (1999: 31) suggests calling them—whose activity may or may not be associated with conscious processes. Based on examinations of patients with perception deficits caused by cortical lesions, Michael Gazzaniga argues that:

> ***phenomenal consciousness, that feeling you have of being conscious of some perception, is generated by local processes that are uniquely involved with a specific activity (…)*** *(Gazzaniga 2011: 65–66).*

Some brain modules mediate conscious perception while others subserve processes to which we do not have immediate access. Phenomenal experiences cannot be immediately reported although they may be conscious. They are not declarative yet but may become so when language centers—which are normally situated around the Sylvian fissure in the frontal, parietal and temporal lobes of the left hemisphere—become involved in the activity of the "perception" modules, thus generating a "unified report" of their processing results. Gazzaniga calls this perisylvian language area the "interpreter module." It is the task and achievement of this module to make the contents of consciousness declarative to which it has access. If this theory holds true, there should be contents of consciousness to which the "interpreter" may not necessarily have access, which would therefore be non-declarative. (This theory also suggests that non-human and prelinguistic human animals should also have conscious perceptions without being able to report them.)

Why should the "interpreter module" try to give a unified report in the first place? The answer appears simply to be because it has been asked to. In fact, the interpreter module will always try to give a unified report even if it has no access to any relevant information, as in the above example of the split-brain patient *(cf.* Gazzaniga 2000, 2011). From an evolutionary perspective, however, such occasional errors are a tolerable price to pay for the advantages that a unified account offers to an organism with declarative consciousness. Based on the finding that all mental activity is mediated by parallel multitrack processes, Daniel Dennett (1993) assumes that the seemingly unified stream of consciousness that we experience actually consists of multiple parallel content-fixing events that are not necessarily contents of our consciousness but altogether represent a stream of multiple drafts of narrative fragments. Any such draft can potentially become part of our seemingly unified narrative but will only become so when it happens to be chosen in response to probing. Since a unified narrative helps to reconcile an organism's past and prospective future, it pays for this organism to probe itself constantly and thus receive a canonical narrative. Naturally, the narrative must center on the organism itself, whose "self" is thus (nothing but) the center of gravity of the narrative. Although there is normally only one such center of gravity for every organism, neurosurgical interventions can create disagreement (Dennett, 1992). If, for example, a complete callosotomy—the dissection of the large fiber-bundle connecting the two hemispheres of the brain—is performed on a patient with incomplete unilateral language dominance, an "alien-hand-syndrome" may occur. In this syndrome, when probed it is the "more dominant" hemisphere that provides the (more or less) canonical narrative, though it may complain about the involuntary actions of the ipsilateral hand. These actions

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are directed by the contralateral hemisphere, which may have its own—non-declarative—center of gravity. That the non-declarative hemisphere can have its own intentions indicates that, at least for a while, it can tell its own story, with or without words. Usually these controversies can be resolved when both hemispheres learn to communicate via remaining interhemispheric connections and the detour of the environment. Eventually, the hemisphere that is in charge of declaring takes the lead. This may be a good "choice" for the organism because verbal narratives are less fleeting, easier to handle and can thus reach further into the past and the future.

A consciousness that can declare itself must have more at its command than conscious perceptions. Antonio Damasio (1999) calls this "extended consciousness," and its scope may span the individual organism's entire lifetime. Extended consciousness makes it possible to relate different experiences to each other and evaluate them in light of the organism's autobiography. To this end, it needs both an autobiographical and an extensive working memory. This working memory must have a large enough capacity to hold active memory contents for some time that define both the autobiographical self and perceptions, pictures or thoughts that reflect external or internal events, it is these two aspects that working memory must bring together. Damasio states that "autobiographical selves occur only in organisms endowed with a substantial memory capacity and reasoning ability, but do not require language," and he believes that "apes such as bonobo chimpanzees have an autobiographical self" (Damasio 1999: 198). Nevertheless, with language humans have a tool unprecedented in the history of consciousness that allows them to perform tricks with memories and perceptions of which no other animal is capable.

We have become so accustomed to, and dependent on, language that it is difficult for us to imagine a conscious mind without it. Perhaps Helen Keller's narrative can help us here. Helen Keller probably contracted meningitis in 1882 at the age of 19 months, which left her deaf and blind. Nevertheless, she earned a Bachelor of Arts degree in 1904 and, in 1908, tried to explain how it is to be conscious without language, hearing, and sight:

> ***Before my teacher came to me, I did not know that I am. I lived in a world that was a no-world. I cannot hope to describe adequately that unconscious, yet conscious time of nothingness. (…) I had neither will nor intellect. I was carried along to objects and acts by a certain blind natural impetus. I had a mind which caused me to feel anger, satisfaction, desire. These two facts led those about me to suppose that I willed and thought. I can remember all this, not because I knew that it was so, but because I have tactual memory. It enables me to remember that I never contracted my forehead in the act of thinking. I never viewed anything beforehand or chose it.*** *(Keller 1908)*

This is the narrative of a human mind before acquiring language. Because Helen Keller could encode lasting entries into her autobiographical memory, there is no doubt that she was conscious. By looking back, she can even make us *feel* how it is to act without having acquired language, sight, or hearing:

> ***I remember, also through touch, that I had a power of association. I felt tactual jars like the stamp of a foot, the opening of a window or its closing, the slam of a door. After repeatedly smelling rain and feeling the discomfort of wetness, I acted like those about me: I ran to shut the window. But that was not thought in any sense. It was the same kind of association that makes animals take shelter from the rain. (…) When I wanted anything I liked, - ice-cream, for instance, of which I was very fond, - I had a delicious taste on my tongue (…), and in my hand I felt the turning of the freezer. I made the sign, and my mother knew I wanted ice-cream. I "thought" and desired in my fingers. If I had made a man, I should certainly have put the brain and soul in his finger-tips.*** *(Keller 1908)*

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This is a narrative of what Damasio calls extended consciousness, made declarative by subsequent language acquisition. If we, in a thought experiment, allowed this mind to see and hear, if we—to use Helen Keller's words—put brain and soul also in the eyes and ears, we can perhaps begin to sense how it might feel to have an extended consciousness without language. If, on the other hand, we imagine this mind without the capacity to create succeeding memory entries as foundation of an autobiographic self, we might come close to Damasio's notion of "core consciousness." This comprises simultaneous representations of a perceived (inner or outer) object and of the organism that does the perceiving. Thus, an organism with core consciousness perceives an object, simultaneously sensing that it is *itself* who perceives and not some other organism. It is almost impossible for us to comprehend because we cannot be conscious without language and memory. Or can we?

Consider golf or tennis pros who play their best game automatically, but start to lose when they cannot help wondering about how. Or consider actors or performers who cherish their "flow experiences" on stage but then start to wonder about their presence or impact on the audience and thus spoil the performance? "One of our enemies is the intellect", says Michael Chekhov about the creative process and the inspiration.

> ***Inspiration comes when everything is forgotten–the method, the technique, the part, the author, the audience, everything. Then the miracle happens. It happens that the play, the part, begins to exist independently of ourselves.*** *(Chekhov 1985: 55)*

These may seem to be far-fetched examples of experiences that most of us normally do not share. But how about driving a familiar route for a while and then suddenly realizing that you cannot remember the last minute or two, even if you had to turn left or stop at a traffic light? If you have a driver's license, you have probably experienced something similar. But were you really driving unconsciously? Daniel Dennett thinks not. He suggests that:

> ***You were paying attention to other things, but surely if you had been probed about what you had just seen at various moments on the drive, you would have had at least some sketchy details to report.*** *(Dennett 1993: 137)*

So it seems that expert athletes, artists, and drivers know exactly what to do, and how to do it best, in a non-declarative way. In the heat of the moment these experts may be very conscious in a procedural way.

DECLARATIVE BRAIN SYSTEMS

Language production and perception depend on the perisylvian cortex of the dominant (usually left) hemisphere. This area acquires its specific function in the first years of life during language acquisition. Before that, the human cortex is still flexible enough to allocate other brain regions to language functions if critical areas are damaged. A shift of language functions to the contralateral right hemisphere, however, can result not from a lesion of cortical "language centers," but from an early lesion of the left hippocampus, an area inside the temporal lobe that supports declarative memory (Weber et al. 2006).

Numerous studies have confirmed the importance of the hippocampus for declarative memory. Memory deficits brought about by damage to this brain structure affect memory contents that are accessible to conscious recollection making it possible to give an account of them (i.e. they are declarative). These memories include facts and events belonging to one's autobiography *(cf.* Squire and Zola 1996, Tulving 2002), and it seems that hippocampal

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contributions to declarative memory are so important for language acquisition that the brain allocates language functions to brain regions within that hemisphere where the hippocampal system is intact. This is usually the left hemisphere, but can also be the right if the left hippocampus is sclerotic. Conversely, language is such an important tool for declarative memory that brain systems mediating language and declarative memory processes can be considered as one system supporting declarative consciousness.

NON-DECLARATIVE BRAIN SYSTEMS

As Endel Tulving highlights, to classify acts of memory systems as declarative or procedural, it is important to distinguish between thought and behavior. He suggests asking oneself whether one can "hold in mind the *product* of the act of memory" (Tulving 2000: 728). If the answer is "no", the act was "procedural". Thus "procedural memory" concerns all forms of non-verbal behavior and is one of the most important parts of the non-declarative memory system. Motor learning, as in sports, or learning how to play an instrument do not depend on the hippocampus, but on the brain's motor systems, including the basal ganglia and cerebellum. Such skills can scarcely be declared, if at all, which makes teaching motor skills so notoriously difficult: Ruminating about a motion sequence can hamper procedural memory and has ruined many-a-performance in concert halls and stadia! If thoughts are not necessary for these performances, and even interfere with them, artists, athletes, and drivers may express their consciousness through behavior. Similarly, when the young Helen Keller protected herself from the rain, she did not think about causal or intentional relations but was "procedurally conscious".

Another kind of non-declarative learning that influences behavior is mediated by emotions. Emotions are physiological processes of which we are unaware. They can eventually become conscious as feelings but, even if they do not, they can influence the human—and non-human—behavior. For example, it has been shown that a patient without a hippocampal formation on either side, who had been severely amnesic for 15 years following herpes simplex encephalitis and who could not learn any new faces or people since then, was still able to acquire preferences according to positive, neutral and negative affective valences that were attributed experimentally to three people (Tranel and Damasio 1993); the affective states that guided him were surely non-declarative. This is true of many physiological changes in response to external stimuli, which influence the brain as emotions and can—as somatic markers—help us in decision-making (Damasio 1994). Thus, emotions are not only non-declarative, but unconscious. Even when they become conscious as feelings, it may be difficult, perhaps impossible, to verbalize them so that some feelings are expressed as metaphor; ' butterflies in the stomach,' for example. Some epileptic seizures with preserved consciousness can elicit a feeling that cannot be verbalized because there is no word for it: No language can derive a word for a feeling that cannot be shared because only an individual person with epilepsy can experience it from a first-person-perspective.

One important benefit of emotional learning is that it can help protect us from potential dangers. To this end, the brain creates a long-lasting association between fear reactions and an object or event that has been experienced as threatening during an earlier encounter. This kind of learning happens automatically and unconsciously, but is very effective. In fact, this so-called fear conditioning is so effective that too much of it can contribute to post-traumatic stress disorders. Conditioning of negative (Le Doux 1996, Phelps et al. 1998) and positive emotions (Murray 2007) depends on the functional integrity of at least one amgygdala, an almond-shaped assembly of neurons situated within the medial parts of both temporal lobes just anterior to the head of the hippocampus. The amygdalae in both

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hemispheres belong to the brain's limbic system, a constellation of evolutionary older brain structures that contribute to such diverse, but related, processes as production and perception of emotions and feelings, monitoring and control of motor behavior, detecting errors or granting rewards etc. One of the powerful methods with which the limbic system controls and guides behavior is making emotions accessible to the prefrontal association cortex as feelings so that we can talk about them and use them for decision-making. Nevertheless, we cannot "decide" to be angry, happy or sad. As Tulving says, we cannot hold in mind the *products* of limbic processes, which are therefore non-declarative.

Fear-conditioning is not the only way humans learn from emotions; someone able to speak a language can also warn and be warned. We usually remember events, people, and objects much better when our first encounter with them was emotionally arousing. In all these cases, the amygdala takes care of the arousal and thus enhances hippocampal activity, which can, in turn, result in lasting memory entries (LaBar et al. 1998). These are the declarative products of memory acts because we can hold them in mind as either images or words. Note, however, that the declarative memory contents we can recall are events, people and objects, not feelings. This dual role of emotions in both declarative and procedural memory may help resolve some misunderstandings in discussions of "emotional memory" in the performing arts.

DECLARATIVE AND NON-DECLARATIVE COMMUNICATION

If consciousness is a product of evolution that serves the survival and well-being of organisms moving freely in their environment, it would be surprising if no signs of consciousness—or other "kinds of minds" (Dennett 1996)—could be found in non-human animals or prelinguistic members of the human species. Nevertheless, it has been suggested that there may have been humans capable of verbal behavior but without the declarative, linguistic consciousness we know (Jaynes 1976). For now, we won't take this suggestion too literally. It will suffice to note that Jaynes discusses how two brain systems—here the two hemispheres—started to interact during the development of declarative consciousness. Recently, Solms and Panksepp (2012) described two other brain systems subserving different aspects of consciousness. They argued that, when discussing how human mental functioning is embodied, two brain representations of the body must be distinguished. First, there is a constellation of (multimodal sensory and motor) somatotopic maps, including the respective cortices and modality specific thalamic and cranial nerve structures that represent the external body and other external objects that provide conscious exteroceptive experiences. Because the perisylvian association cortex is part of this system, we can conclude that it is declarative. A second constellation of brain structures, including centers in and around the hypothalamus, brain stem, and emotion circuits that overlap with the limbic system, represents the internal body. These subcortical structures may generate "phenomenal affective feelings of their own" (Solms & Panksepp 2012: 155), and thus another kind of consciousness, not of objects but the subject of perception:

> ***We may picture this type of consciousness as the neurodynamic page upon which, or from which, exteroceptive experiences are written in higher brain regions.***
> *(Solms & Panksepp 2012: 156)*

Since animals have emotions that help them guide their behavior (Panksepp 1998), we must grant them some type of non-declarative minds mediated by this second, and more centrally

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localized, constellation of brain structures. This system does not include any cortical centers that are relevant for human language and thus is non-declarative, though non-declarative does not necessarily mean non-communicative. In fact, social animals have a variety of means of communication, including alarm calls that not only signal danger but also whether a predator is approaching from earth or air etc. (see e.g. Hauser 1996). These vocal communications in animals are not mediated by the perisylvian cortical centers used for human language, but by brain areas that support emotional processing. For example, the anterior cingulate gyrus, an important component of the limbic system within the medial frontal lobe, participates decisively in the production of *innate* emotional vocal patterns. By contrast, the motor cortex and its feedback loops involving the basal ganglia and the cerebellum contribute to the production of *learned* vocal patterns (Jürgens, 2009). Data from presurgical evaluations of epilepsy patients indicate that both of these systems are still alive and well in human brains. While the motor cortex and perisylvian language centers produce speech, focal seizures within the amygdala can elicit crying, and seizures within the anterior cingulate gyrus can elicit screaming, swearing and laughing (without feelings of mirth). Although the expletives used in this involuntary swearing originate as words from language, ictal swearing is not propositional speech, but unconscious, overlearned and automatic motor behavior. Nevertheless, expletives result in immediate emotional effects in other humans, as do other emotional vocalizations like laughing, sobbing, groaning, crying, and screaming in humans and non-humans; effectively these act as emotional remote controls. These vocalizations are, however, not linguistic signs; perhaps not even their precursors. One important difference between linguistic signs and emotional vocalizations is their acquisition: While words can and must be learned, emotional vocalizations are innate behavior; even children born deaf and blind laugh and cry. With words and the appropriate syntax, it is possible to form an infinite number of sentences, while the repertoire of emotional vocalizations is finite, limited and not generative. Words can help keep in mind the *product* of working memory processes in forms of thoughts so that this product can be an *object* of thought processes again, while emotional vocalizations are behaviors intrinsically linked with the associated emotions. For humans and non-humans alike it is difficult—though not impossible—to control and suppress these emotional vocal behaviors. Whatever control is possible is mediated by a "medial cortical system" of vocalization control (Fitch, 2010), which is headed by the anterior cingulate gyrus (Jürgens 2009) and may represent the "voice" of the constellation of brain structures representing the internal body (Solms & Panksepp 2012) and perhaps the voice of "core consciousness" (Damasio, 1999).[1]

A new kind of voice control appears first in human primates with a vocal motor circuitry that Fitch calls "lateral cortical system" (Fitch, 2010, p 350), which perfectly meets the demands of the perisylvian language centers. The lateral cortical system and the perisylvian cortex of the dominant hemisphere may together represent the communication center of what Solms and Panksepp call the "external body," and of declarative consciousness. Even though we now have defined two independent communications systems of the human brain—a medial cortical non-declarative and a lateral cortical declarative system—it is unlikely that the first evolved into the second, and therefore it is unlikely that emotional calls evolved into human language for two reasons. First, both systems still function fairly independently in modern humans. Second, both motor prerequisites for speech and cognitive prerequisites of language require language evolution to be free of the innate bondages to specific emotions.

1 While Michael Chekhov would simply state: "In our art we don't have to have reasons. As soon as we have to have reasons, we can do nothing with them, and then it is not art. The actor must be able to cry without reason, simply because he is an actor. If he cannot cry immediately, then he must leave the stage. If he has to recall the death of his father, poor old man, etc., etc., then he is not an actor." (Chekhov 1985: 30)

CONSCIOUSNESS PERFORMED

When language evolved—whether Homo erectus or Neanderthals possessed a protolanguage, or whether language appeared only later in Homo sapiens—may still be a matter of debate. Because non-human primates, however, can use tools to some extent and early

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pre-linguistic hominids made and used tools in a much more sophisticated way, we must assume that our last common ancestor—and certainly early hominids—had an extended (though not yet declarative) consciousness. Making and using tools cannot be inherited, so those who used them must have been able to teach and to learn. Without language, this can only have been demonstrated and imitated; an important reason for Donald (1991) to call the prelinguistic culture of Homo erectus "mimetic" and emphasize that pedagogy must have been important for mimetic cultures. Mimetic pedagogy seems an unproblematic method for teaching skills like making and using domestic tools. To teach hunting and fighting in this way, however, seems tricky because, without luck, teacher, pupil, or both, might not survive the lesson! Sooner or later *play acting* hunting and fighting will have become necessary. In other words, adults had to *pretend* conscious actions; they had to make their pupils imagine an animal to be hunted or an enemy to be fought, and in doing so they had to make sure the imagined hunter or enemy did not become too realistic and trigger automatic fight-or-flight reactions. Merlin Donald observes:

> *Much of the education of children in simple societies is still mimetic in nature. The basic vehicles of such training are reciprocal mimetic games and the imitation and rehearsal of skills. Children mime adults in every respect, including mannerisms, posture, and gesture, they learn the customs and scenarios associated with each principal arena of action, and they acquire the manufacturing and survival skills essential to the tribal way of life. In addition, children learn a series of subtle limitations on impulsive behavior in a variety of contexts. (Donald 1991: 176f.)*

If children had to learn to control their impulsive behavior in these teaching sessions, their teachers also had to control theirs. This suggests that early hominids could imagine and plan future events, and thus had command of a non-linguistic kind of reasoning that permitted what Karl Popper claimed for a critical scientific method, namely to let "our hypotheses die in our stead" (Popper as cited in Dennett, 1995). The need to control, and not trigger, their pupils' fight-or-flight reactions made it necessary for these early adult hominids to play act in such a way that it was possible for their children to recognize the teachers' *play* acting for what it was; i.e. the performance had to be recognizable as such. Or, as Rhonda Blair puts it: "Like a memory, the image is a thing unto itself, just as real as—but not the same—the object that triggered it". (McConachie/Hart 2006: 178)

We are not the first to suggest such a natural origin of the performing arts. For example, David Timson conjectures:

> *Acting, however, is as much a part of human nature as loving, or making war. Every day we act out to others the day's events. So perhaps in primitive times, before the development of language, theatre fulfilled a need. The need to communicate to the rest of the tribe where food could be found, for instance, and re-enact in dumb-show, the hunt. (Timson 2000)*

We think, however, that employing play-acting for pre-linguistic teaching purposes may have helped emancipate vocalizations from their immediate emotional effects. If actors and spectators—teachers and pupils—could reassure each other that they were engaged in play instead of a real hunt or fight, it was perhaps safe to "quote" a human—or non-human—emotional call. Perhaps play-acting paved the way for some of the first words of humans' protolanguage:

> *... if we ask how a species* already *possessed of imitative skills could come to acquire specific word meanings, innate cries could provide fodder for a different category of words from onomatopoeia, including words for emotions, for reactions to events, and for individuals (e.g. by imitating their laugh). Thus one can reject the idea that*

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> ***innate calls form the seed of voluntary vocalization (…), while accepting that once imitation was present, such calls could form models for certain words, although they are not words themselves.*** *(Fitch 2000: 392f.)*

Thus play-acting could have contributed to the evolution of both a lexical and—through gesture—to a gestural protolanguage (e.g. Tomasello 2008).

Since declarative memory serves not only to preserve episodic memories but also to plan the future, and since language with its recursive syntactical structures provides the perfect means to relate thoughts, language evolution may also have accelerated the transition from object- and emotion-driven behavior to explicitly (and declaratively) planned actions. During the evolution of language as a social system, mnemonic and linguistic competencies may not always have developed in parallel, from which some of the Jaynesian discrepancies between linguistic behavior and declarative consciousness may have emanated. It is conceivable that individuals may have been able to verbalize a plan but not yet have been able to encode this plan reliably into their declarative memory. For acting, these individuals may still have had to rely on object- or emotion-driven motivations, and if declarative memories were not yet firm enough to motivate goal-oriented labor in all situations, it might have been helpful to rely on external memory markers like totems or pyramids.

EMOTIONS PERFORMED

During the transition from emotional calls to linguistic communication, the extended consciousness of hominids became increasingly declarative. However, while language evolution required the emancipation of vocalizations from their immediate emotional consequences, perhaps there were situations in which humans missed the direct power that their limbic vocalizations exerted over others. In spite of all its advantages, propositional language calls for argumentative minds and does not have the unhampered power of emotional remote control. That this process of emotional detachment has disadvantages may have become evident during teaching by play-acting. Then, as now, there probably was a pedagogic "arms race" between the teachers' need for their pupils' attention and the pupils' inclination to lose interest. For those who play-acted—the first representatives of the performing arts—it was perhaps sometimes necessary to again rely on emotions and intersperse the teaching act with occasional "real" alarm calls. The need for emotional arousal, or perhaps Jaynesian attempts to sidestep declarative argumentations and to tap directly into emotional inspirations for actions, may also have motivated the performance of rituals.

The necessity to elicit emotions was seen by rhetoricians over 2000 years ago. Their instruction manuals even classified emotions, the purposes for and the means by which they could be elicited according to the hierarchical system of the "decorum", in which not only gestures were designated higher or lower rankings between the poles of the "sublime" and the "low". The most sublime and important gesture and figure of speech, the aposiopesis, was to break off a sentence leaving it unfinished, accompanied by a spreading of both arms, which even threatened to let the toga slip down (Mühlmann 1996). The orator showed himself to be completely exposed, so overwhelmed by his feelings that he was unable to further verbalize his thoughts. This sublime gesture and figure of speech came not without peril for the orator; he ran the risk of making a fool of himself if either his emotional appeal to the audience was inappropriate to the subject of his speech, or if it did not work. The orator had to make sure that he succeeded in remote controlling his audience's emotions and, to this end, the rhetorical instruction manual taught that the orator must really experience the emotions he wanted to elicit in his audience. Verbal communication, with all its connotations and prosody, was not enough for this sublime purpose, it had to end and let the body talk (by means of the medial cortical, limbic system).

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This rhetorical technique brings several methods of acting to mind, training to reach the unconscious by conscious means. Based on the teachings of Konstantin Stanislawski, further developed by Lee Strasberg, Michael Cekhov to name but three, a method was created that enables actors to recall emotions from their own biographies to identify with their roles, whether on stage or in a movie scene. Judging from neuropsychological memory theories, this must seem to be a contradiction. Recall is a method that retrieves an item stored in declarative memory, i.e. a *"product* of the act of memory" (Tulving 2000: 728). However, as we have shown, emotions are unconscious, and feelings non-declarative memory processes that cannot be recalled. But we also showed that conditioning can pair selected triggers with emotional responses. To find out whether top-class actresses and actors can really elicit their own feelings on demand, we performed a study using functional magnetic resonance imaging (fMRI), a technique used to show active areas within the brain. We asked participants to imagine ten different scenes of their repertoire (for 30 seconds each) with all the empathy and emotion they would use on stage. Then we compared their brain activity elicited by this task with the actors' brain activity when they rehearsed the text of the same scenes without being emotionally involved. We found that 6 out of 9 actresses and actors participating in this study activated the amygdalae in their temporal lobes and a ventromedial part of the frontal lobe that is also part of the limbic system. So, it seems that experts within the performing arts may be able to pair their feelings with characters or events on stage or on a set. (Whether "the method" is the only way to do this, or whether intensive examination of both oneself and the character to be impersonated can accomplish the same thing, is not within the scope of this chapter.)

When the Institute for the Performing Arts and Film and the Swiss Epilepsy Centre joined forces to study whether actresses and actors can recall not only emotional episodes, but the actual emotions, we had no idea that this study would take us on an emotional journey halfway around the world.

Many have experienced being deeply touched by actors and actresses while watching a play, but how can they convey such complex feelings? And do they really "love" or "hate" their partners while acting, or are they merely pretending?

Arts and sciences have a long tradition of quarreling over such questions like 'hot' or 'cold' acting, emotional identification or distant simulation. Using modern techniques of imaging brain activity, a joint research program *Authenticity of Emotion*,—from which the lecture-performance *Act Like You Mean It* evolved—has examined whether actors use emotions in their performances. Aided by Shakespeare's Romeo and Juliet balcony scene, we presented our findings as part scientific lecture, part performance. But how could we perform research results, especially when they come from such a complex subject as emotions? Emotions, however, are precisely what performers claim expertise in.

To summarize the *tour de horizon:* it was the local context and intimacy that allowed the spectators to identify with the actors and characters. What we initially considered a disadvantage—working with local performers for the home audience in their local language—became a real advantage; it drew the spectators into the dilemma between scenic attraction and scientific explanation. One conflict in the back and forward between theory and art resolved itself only at the end, when the play could be seen and felt as a piece in a closed course, when head and stomach would, momentarily, correspond perfectly.

Nevertheless, for those of us who are not successful, professional performers, it is not possible to recall emotions. We can recall emotionally relevant events, and thus most of us can understand what Trevor Nunn meant when he wrote in the lyrics of "Memory", a song from the musical Cats: "I remember the time I knew what happiness was". But recalling the associated emotion, i.e. "re-*feeling*" happiness (or sadness, anger, pain, or love) is difficult for most of us. This is probably one reason why early and modern declarative cultures have always cherished the arts. If not to artists, to whom else should we turn when we want to have feelings elicited deliberately? After all, they have been using emotional remote controls since the time of mimetic cultures. In contrast to rituals and rhetoric, however, the perform-

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ing arts have had to use their emotional remote controls together with a declarative safety net, which protects us from immediate fight-or-flight reactions. Some declarative safety net would still appear to be indispensable, even for the modern performing arts. Without this, the audience might mistakenly perceive the villain on stage as authentic and flee, or even kill the actor, which allegedly happened to an actor who played Iago too convincingly (Epstein 1993). Rituals and rhetoric, in contrast, do not play-act and have no use for emotional safety nets. They deliberately use whatever emotional remote controls they can access.

The audience, then, wants the performing arts to create emotionally moving events. We should not forget, however, that, like novels, dramas are not least narratives in which plans of actions and conceptions of lives are dramatized alongside emotions. To convey the "full mental monty," the performing arts must address both our declarative and non-declarative consciousness. If our selves are the centers of gravity of our own narratives of consciousness, then other narratives show us other centers of gravity or, as Iris Murdoch put it: "The purpose of literature is to show that other people exist." If drama catches us both declaratively and emotionally, it might even let us witness alternative conceptions of *our* lives, which we may let die on stage in our stead.

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