

Words, gestures, brains and caves. Remarks on the material bases of language

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§ 1 Introduction

In the last volume of *In Search of Lost Time*, Proust wrote: “I realised that the essential book, the one true book, is one that the great writer does not need to invent, in the current sense of the word, since it already exists in every one of us — he has only to translate it. The task and the duty of a writer are those of a translator” (Proust 2018, 538). The idea that structured thoughts exist in the mind before linguistic expression, as a kind of ‘language of thought’, has an ancient and honored tradition in philosophy, so much so that Proust here took for granted that even his book – one of the monumental masterworks of Western Literature – could be available in his mind before being ‘translated’ into its written form.

Indeed, phenomena such as the “tip of the tongue” experience and visual imagination strongly suggest that thought cannot be reduced to language. However, Chomsky’s hypothesis of a “universal grammar” and Fodor’s hypothesis of a structured “language of thought” are controversial in today’s cognitive sciences (Corballis 2017, 57ff.). A major point of disagreement concerns the prospects of an evolutionary theory of language. Chomsky (1988) denied that universal grammar could be conceived as a product of gradual evolution. Chomsky’s position did not entail any critique of Darwinism in itself, it rather stemmed from the methodological argument that the principles of human language can be derived from the study of language as a formal combination of signs rather than a tool of communication that evolved by natural selection in a natural environment. A similar methodological hiatus was defended by Fodor, whose “language of thought” hypothesis draws on the study of the mind without addressing the environmental context. Many scholars disagree with this philosophical perspective. Ferretti and Adornetti highlight that these views converge with the philosophy of Descartes for their notion of language as a mark of the “human difference” with respect to other animals and for their methodological “solipsism”. They argue that “the specter of Descartes [...] continues to hover in the models still prevalent in cognitive science”, while “to propose a genuinely naturalistic perspective, the models of language inspired by the Cartesian tradition must give way to those tied to the Darwinian perspective” (Ferretti and Adornetti 2014, 29).

This controversy suggests the importance of philosophical-scientific frameworks for the study of linguistic expression. On the one hand, the “Cartesian” perspective is associated to the priority of mind over matter and to the representation of the individual speaker as isolated from the context of social interaction. On the other hand, the “Darwinian” perspective is associated to the picture of thought as a natural process and to the inseparability of linguistic praxis from the environment. In turn, this alternative is related to the study of the material conditions of language, and literary expression in particular, in neurolinguistics and neuroaesthetics. Hence the analysis of the brain correlates of linguistic understanding and production, including writing, as well as the consideration of the body in

its environmental and social context as a condition of linguistic interaction, may appear as the consequence of a rejection of Cartesianism and the adoption of a Darwinian perspective. However, this polarization is grounded on an oversimplified picture of the philosophical and scientific roots of contemporary investigations on brain and language. In this paper, I will reconsider a number of crucial moments of this story, focusing on the growing understanding of the material bases of language in modern philosophy and science. In § 2, I will argue that Descartes' philosophy could not be reduced to the sharp separation of mind and body that I have outlined above, and indeed Descartes introduced the hypothesis that the whole body is engaged in the production of affective states. In § 3, I will show that the view of language as grounded on the body and social interaction was considerably developed in modern philosophy long before Darwinism. In § 4, I will point out that, even in post-Darwinian philosophy, the critique of "solipsism" and the conception that the study of linguistic meaning requires the whole body were developed independently of Darwinism. In § 5, I will turn to neuroscience and neuropsychology, showing that the neural correlates of linguistic comprehension, linguistic production and writing have been long separated, and that, at the same time, the plasticity and interconnection of different functions in the brain network has been long debated. On this background, in the concluding section, I examine the problem of the separation and interdependence of orality and writing and I sketch a conjecture on the material bases of language in the context of prehistoric art.

2. Thought, language and body: the Cartesian background

Descartes, as is well known, has been considered as a controversial pioneer of philosophy of mind and cognitive sciences in general. On the one hand, because of his distinction of the "thinking substance" from the body, Descartes has been considered as the arch-dualist and the enemy of physicalism. According to Paul Churchland (1984, 8), "as Descartes saw it, the real you is not your material body, but rather a nonspatial thinking substance, an individual unit of mind-stuff quite distinct from your material body." Antonio Damasio famously described "Descartes' error", that is "the abyssal *separation* between body and mind» (Damasio 1994, 249–250, my italics), as the fundamental obstacle to a neuroscientific theory of self and emotions. Descartes' thesis that his own mechanistic model was limited and could not explain the conscious mind has been also valued by a number of contemporary philosophers of mind following the thesis that consciousness requires an extension of scientific models beyond standard mechanism, such as John Searle and David Chalmers. On the other hand, Descartes – since the "Treatise on Man" (*L'homme*) – was also one of the first and foremost mechanist philosophers and the author of the model of man as a "machine", whose parts "imitate all those functions we have which can be imagined to proceed from matter and to depend solely on the disposition of our organs" (AT XI, 120) and thus allows to explain a large number of cognitive and motor functions. The prominent neuroscientist Jean-Pierre Changeux attributed to him "a first connectionist model of the functional architecture of the nervous system" (Changeux, Ricoeur 1996, 47ff). Neuroscientific reductionism, as it were, resulted from a Cartesian program that renounced its dualistic side and the limitation of its mechanistic models. Hilary Putnam and others notably denounced the "Cartesian materialism" of contemporary philosophy of mind: while Descartes had identified the human being with a separate incorporeal soul, modern neurophilosophers reformulated this mistake in their own terms, trying to identify the

conscious mind with the brain, whence the reductive conclusion “you are your brain” (Putnam 2012, 589).

Concerning human language, Patricia Churchland (1986, 318) argued that Descartes, “though he was a keen mechanist [...] simply could not imagine how a mechanical device could be designed so as to follow rules of reasoning and to use language creatively” and therefore he concluded that “reasoning betokens a nonphysical substance”. His scientific imagination was based on the model of “clockwork machines and fountains” and lost its plausibility in the light of “modern symbol-manipulating machines”. In this perspective, the case can be seen as an admonition to contemporary critics of physicalism, whose arguments may sound “new and clever”, but whose “motivating intuitions are discernibly Cartesian”. Today we should just drop Descartes’ dualism and turn to materialism.

Let me consider all these claims in historical perspective. As a matter of fact, Descartes did not defend a “separation” of mind and body, he rather claimed that mind and body are “distinct” and at the same time united.¹ Against this metaphysical background, Descartes introduced his account of language, which is based on the interplay of body and mind, and provided important premises of successive investigations of language and communication. First, the notion that human behavior can be explained by means of stimuli and partially automatic responses. This theory famously entailed the postulate – which has been later criticized with plenty of evidence and arguments – that non-human animals act without any kind of consciousness. Nevertheless, Descartes dualist model of human behavior, based on the interplay of mechanical processes and the free activity of the soul rolling the pineal gland and, thereby, moving animal spirits in the nerves, still deserves reconsideration for its complexity.²

Concerning language, indeed, Descartes accepted the view that ideas exist in a non-physical soul, and yet admitted of “material ideas” as seats of representations in the brain. In §§ 44-45 of *Les passions de l’âme* (1645) he also connected the soul-brain interaction with the formation of habits and hence to language understanding, learning and production.

“When we speak, we think only of the meaning of what we want to say, and this makes us move our tongue and lips much more readily and effectively than if we thought of moving them in all the ways required for uttering the same words. For the habits acquired in learning to speak have made us join the action of the soul (which, by means of the gland, can move the tongue and lips) with the meaning of the word which follow upon the same movements, rather than with the movements themselves” (AT XI, 362).³

The separation of meaning, as a mental property, and brain processes had been introduced in the *Discours de la méthode* (1637), in a passage that deserves to be analyzed for our purposes. Descartes argues that machines conceived as reproductions of humans would be unable to reproduce the full capacity of human language, which therefore requires the introduction of the immaterial soul.

“They could never use words, or put together other signs, as we do in order to declare our thoughts to others. For we can certainly conceive of a machine so constructed that it utters words, and even utters words which correspond to bodily actions causing change in its organs (e.g. if you touch it in

1 On this controversy see Pecere (2020, Introduction and ch. 1).

2 See Sutton 1998, in part. 81.

3 This view was introduced in order to show that we can control our passions, for these – similar to meanings – can be indeed “aroused or suppressed by the action of our will, but only indirectly through the representation of things which are usually joined with the passions we wish to have and opposed to the passions we wish to reject” (AT XI, 362–3).

one spot it asks what you want of it, if you touch it in another it cries out that you are hurting it, and so on). But it is not conceivable that such a machine should produce different arrangements of words so as to give an appropriately meaningful answer to whatever is said in its presence, as the dullest of men can do”.

The reason for this inconceivability lies in the difference between the flexibility of reason and the fixedness of organic mechanisms, for “whereas reason is a universal instrument which can be used in all kinds of situations, these organs need some particular disposition of their organs for each particular action; hence it is for all practical purposes impossible for a machine to have enough different organs to make it act in all the contingencies of life in a way which our reason makes us act” (AT VI, 56–57). In other words, the physical explanation of language is inconceivable because of the alleged impossibility of reducing the innumerable “circumstances of life” to prefixed reaction mechanisms in the brain. The weakness of this argument arguably depends not merely on the lack of more refined mechanistic models – as argued by Patricia Churchland –, but also on the bracketing off of environmental and social interaction from linguistic activity, which is thus reduced to mechanisms inside the body.

Descartes’ philosophical notion of reason as the power of an immaterial soul reflected his philosophical project of breaking with the passivity of learning, hence Descartes wrote that we should read books while taking care of the danger that “traces of their errors will infect us and cling to us against our will and despite our precautions” and, before reading a book, he “would try and see whether perhaps I could achieve a similar result by means of a certain innate discernment” (AT X, 366, 403). However, philosophers soon argued that flexibility of language and critical insight might be explained on material basis, if only one did not reduce the latter to prefixed mechanisms in machines made of inert and passive matter.

3. Naturalizing language in the Enlightenment: body, gesture, word

The diffusion of empiricist and materialist thought in the Enlightenment stimulated a widespread investigation of the material bases of language, which contrasted the Cartesian conception of meaning as an idea represented by the immaterial soul. Both George Berkeley and Étienne de Condillac remarked that Locke’s *Essay on Human Understanding*, however important for his empiricist perspective, failed to recognize the limits of the Cartesian discourse on the precedence of mind over language and thus introduced the analysis of ideas (in books 1-2) before the account of language (book 3).⁴ This was all the more remarkable since Locke himself was undermining Descartes’ view, as he denied the existence of innate ideas (in book 1) and pointed out that children usually learn words concerning ideas they still do not grasp (Locke 1975, 3.5.15; 3.9.9). These remarks suggested that linguistic communication had to be understood rather as a precondition of silent thought and stimulated a number of hypotheses on the origin of language, conceived as the result of physical interaction by means of gestures and inarticulate sounds. Materialists, like Denis Diderot, concluded that brain, rather than the soul, is the source and support of meanings. I will shortly address both topics of investigation – origins of language and brain localization – for, as we will see, eighteenth-century works were the direct sources of crucial hypotheses in contemporary sciences of language.

⁴ See Aarsleff 2001, xvi.

Condillac's seminal discussion of the origins of language takes place in the *Essai sur l'origine des connaissances humaines* (1746). Condillac imagines the case of two children living after the deluge. As long as they were isolated from each other, their survival required perception and memory, but did not entail the establishment of development of lasting memories and imagination. This changed when they lived together:

“When they lived together they had occasion for greater exercise of these first operations, because their mutual discourse made them connect the cries of each passion to the perceptions of which they were the natural signs. They usually accompanied the cries with some movement, gesture, or action that made the expression more striking [...] The frequent repetition of the same circumstances could not fail, however, to make it habitual for them to connect the cries of the passions and the different motions of the body to the perceptions which they expressed in a manner so striking to the senses. The more familiar they became with the signs, the more readily they were able to call them to mind at will” (Condillac 2001, II, § 2-3, 114-115).

On this account, cries and gestures precede articulated language as “natural signs”, and establish the condition of the development of memory and the use of artificial signs.

“The cries of the passions contributed to the development of the operations of the mind by naturally originating the language of action, a language which in its early stages, conforming to the level of this couple's limited intelligence, consisted of mere contortions and agitated bodily movements [...] Nevertheless, when they had acquired the habit of connecting some ideas to arbitrary signs, the natural cries served as a model for them to make a new language” (Condillac 2001, II, §§ 5-6, 115-116).

On the whole, Condillac's perspective reflected his view that human thoughts – including judgment, desire, passions – are nothing but “transformed sensations”. While he also recognized an immaterial soul as a condition of consciousness, Condillac insisted that sensations are strictly bound to nervous processes: “The perceptions of the mind have their physical cause in the shock to the fibres of the brain” (Condillac 2001, I, § 24, 30).

Condillac's problem of connecting sensations and body was shared by Pierre Louis Maupertuis and Denis Diderot, who both admitted the hypothesis of matter as originally endowed with sensibility (Dunham 2019). In Diderot's *Éléments de physiologie* (1769), sensation was a “quality of matter” and the brain turned out to be not merely a physical support for memory and a condition for physical operations of the body; it was rather conceived as a sensitive organ. This idea was significantly expressed by the metaphor of a “book which reads itself”, which entailed the thesis of the precedence of understanding on expression.

“In order to explain the mechanism of memory we have to treat the soft substance of the brain as a mass of sensitive and living wax, which can take on all sorts of shapes, losing none of those it received, and ceaselessly receiving new ones which it retains. There is the book. But where is the reader? The reader is the book itself. For it is a sensing, living, speaking book, which communicates by means of sounds and gestures the order of its sensations; and how does it read itself? By sensing what it is, and displaying it by means of sounds” (Diderot 1975–, 470. Cf. Wolfe 2014).

This theory may appear to assert, on a new “vital materialist” ground, the precedence of self-perception on communication.⁵ However, in Diderot, the very fact that the brain itself had to read its own traces suggests – contrary to Descartes – that the act of understanding is not an immediate intuition of the mind and is rather a mediated process, which can be hardly separated from the intersubjective context of communication. Be that as it may, the latter

⁵ Similarly Herder, in the *Abhandlung über den Ursprung der Sprache* (1777), would claim that an intrinsic “reflexivity” (*Besonnenheit*) is a condition of the understanding of the natural “affective language” which gives “voice to sensation” (the latter, in turn, is a condition of rational thought) (see Herder 1986).

view gained ground in 20th century philosophy, establishing the ground to a revival of naturalistic theories of the origin of language.

4. From private language to social interaction

A view of language as an intersubjective praxis rather than an expression of preconceived thoughts was famously advocated by Ludwig Wittgenstein in the *Philosophical Investigations* (1953), leaving a lasting legacy in contemporary philosophy of language and neuroscience. Taking the cue from a purely ostensive understanding of language, Wittgenstein insisted on the “countless different kinds of use of what we call “symbols”, “words”, “sentences””, and introduced the notion of “language-game”, which was “meant to bring into prominence the fact that the *speaking* of language is part of an activity, or of a form of life” (Wittgenstein 1967, § 23, 11). The concept of “form of life” designated all the shared characteristics – including physical ones – that were presupposed for the mutual understanding in linguistic communication. In this perspective, Wittgenstein pointed out that “commanding, questioning, recounting, chatting, are as much a part of our natural history as walking, eating, drinking, playing” (§ 25, 12). The analogy between language and games allowed to account for the evolution and the innovation of linguistic rules, for “is there not also the case where we play and – make up the rules as we go along? And there is even one where we alter them – as we go along” (§ 83, 39). The whole conception introduced Wittgenstein’s celebrated argument against private language, the inner designation of feelings and thoughts conceived as independent from linguistic interaction, as it had been implicitly in a long philosophical tradition – e.g. in Descartes.

This argument had the important philosophical consequence of denying that mental states can be conceived and defined abstracting from behavior and hence from the body:

“Only of what behaves like a human being can one say that it *has* pains.

For one has to say it of a body, or, if you like of a soul which some body *has*” (Wittgenstein 1967, § 283, 97–98).⁶

This perspective was apt to include modern naturalistic theories concerning the origin of language, including their intersubjective setting. In *Zettel*, Wittgenstein devotes a passage to the learning of language in children and concludes:

“Being sure that someone is in pain, doubting whether he is, and so on, are so many natural, instinctive, kinds of behaviour towards other human beings, and our language is merely an auxiliary to, and further extension of, this reaction. Our language-game is an extension of primitive behaviour. (For our *language-game* is behaviour.)

(Instinct)”. (Wittgenstein 1967b, §545, 96e).

Wittgenstein’s conception of language and critique of pure inner thought has been reprised by Daniel Dennett. In *Consciousness Explained* (1991), Dennett comments on the traditional notion of inner language as a condition of articulated thought, quoting a statement by Hughling Jackson (1915): “We speak, not only to tell others what we think, but to tell ourselves what we think”. Hughling Jackson argued that thought is originally linguistic, but Dennett – elaborating on Wittgenstein – also wants to replace the very idea that an internal “central meander” understands language before the acts of communication and argues that

⁶ On this thesis and its Aristotelian roots see Pecere 2020, 137–138.

the very formation of meanings is inseparable from linguistic interaction as a production of brain activity. Dennett claims that the language of *Homo sapiens* originally resembled communication among primates, with communicative acts that do not entail the interpretation of the intention of the utterer, but rather served to a mutual orientation in practical situation. Hence, “request” utterances might elicit “helpful” utterances in the context of a project, e.g. finding food. On Dennett’s thought experiment, this social practice eventually (and accidentally) led to the “invention” of inner language by “autostimulation”.

“Then one day (on this rational reconstruction), one of these hominids ‘mistakenly’ asked for help when there was no helpful audience within earshot – except itself! When it heard its own request, the stimulation provoked just the sort of other-helping utterance production that the request from another would have caused. And to the creature’s delight, it found that it had just provoked itself into answering its own question” (Dennett 1991, 195).

The elicitation of reactions thus prompts the evolution of more and more refined forms of language. Be that as it may, Dennett’s speculation is an example of naturalistic views, focused on the precedence of sounds or gestures on articulated words and thoughts, that have been reprised by many contemporary linguists, merging the legacy of Wittgenstein to the investigation of philosophers of the Enlightenment on the origins of language. However, a major breakthrough of empirical research has been the evidence in support of a gestural, rather than vocal, origin of language. Primatological evidence is one of the sources of this theory: while the production of sounds in primates is mostly reflex-like, they voluntarily use facial expressions, hand gestures and bodily postures with flexible meanings in different contexts (see e.g. Tomasello 2008, Arbib *et al* 2008). It is an irony that this very kind of evidence, which had been first invoked by Chomsky and others in support of the view of the difference of human language, has served to dismiss the latter’s views in the light of gradualist theory in the spirit of 18th century hypotheses by Condillac, Rousseau and others. Michael Corballis, one of the major advocates of these views, has explicitly mentioned Condillac’s theory on the priority of gestures on articulated sounds as a seminal account and indeed he subscribes to the whole conjecture on the transition from gesture to speech. In a chapter called Condillac’s story:

“goes on to explain how articulated sounds came to be associated with gestures, but ‘the organ of speech was so inflexible that it could not articulate any other than a few simple sounds.’ Eventually, though, the capacity to vocalize increased and ‘appeared as convenient as the mode of speaking by action; they were both indiscriminately used; till at length articulate sounds became so easy, that they absolutely prevailed.’ Actually that says it all, and this chapter could probably stop right here.” (Corballis 2017, 124).

The mentioned chapter is titled “Hands on to Language” and is precisely devoted to the discussion of the gestural origins of language. It is remarkable that, although Corballis attempts an evolutionary theory of language, he points out that Darwin himself still believed to the alternative theory: “I cannot doubt – Darwin wrote – that language owes its origins to the imitation and modification of various natural sounds, and man’s own distinctive cries, aided by signs and gestures.”⁷

This turn in post-Darwinian theories of the origin of language has been crucially supported by neurological evidence. To this we have to turn now, in order to focus on the problem of how different expressive functions and organs are connected or disconnected.

⁷ Darwin 1871, 87 (quoted in Corballis 2017, 131).

5. Neural correlates

The investigation of the neural correlates of mental faculties made groundbreaking progresses in the 19th century, leading to experimentally grounded hypotheses on the structures and physiological processes that accompanied cognitive and motor activities (Clarcke, Jacyna 1987, Hagner 2008). These advances in anatomy and physiology supported materialist views: Magendie (1816, I, 170) regarded intellectual processes as “the result of brain action” and urged “not in any measure to distinguish them from other phenomena which depend on organic action”. Localization hypotheses were often conjectural and could even include uncontrolled speculations (such as those of Franz Joseph Gall’s phrenology), thus raising the opposition of those (notably Pierre Flourens) who advocated the Cartesian thesis that the mind is a unity and cannot be articulated into separated faculties and respective brain correlates. The discovery of brain correlates of various capacities often derived from clinical evidence of injured or impaired brains, an example being the localization of “language areas”. As is well known, these included the Broca area for language production and the Wernicke area for the comprehension of written and spoken language. Damage to these areas entailed different kinds of aphasia. The discovery and determination of these areas, which was subsequently refined by means of fMRI and similar techniques, suggested that language not only depends on brain processes but has to be analyzed into different and functionally disconnected capacities, whether production and comprehension, written and spoken language are involved.

Subsequent investigations have shown that neural plasticity allows the realization of functions in different areas of the brain, thus suggesting that the opposition between localized and global functioning of the mind has to be blurred. Nevertheless, neuroscientific investigations have proved an articulation of semantic functions and their respective brain correlates that has been brought to bear on traditional issues, including hypotheses on the gestural origins of language. A notable example is the discovery of mirror neurons by Giacomo Rizzolatti and his colleagues in Parma. These neurons – originally detected in monkeys – discharge when the animal performs an intentional act with the hands (e.g., trying to grasp an object) *and* when it observes another primate (human or monkey) accomplish a similar intentional act. Mirror neurons usually respond to both the execution of act with the hands and to facial expression. In general, the fact that these neurons are activated both by the performance and the observation of an act suggests that they play a crucial role in the learning by imitation of complex operations and behavior, including communication. Empathy has also been connected to their activation, thus reviving a theory of the “imitation of affects” that goes back at least to Spinoza.⁸ As it has been pointed out (Fadiga, Craighero *et al* 2006; cf. Corballis 2017, 129ff), the position of these neurons overlaps with language areas in the brain and hence they have been connected to the issue of the origin of language since the 1990s, bringing support to those – such as Corballis himself,

8 On mirror neurons as bases of empathy and social identification see Gallese 2009. Spinoza’s theory of the imitation of affects – in the *Ethics* – was based on the claim that the observation of passions in other individuals elicits the same passion in the observer. Although this claim was not entirely original in itself, Spinoza’s philosophy, where physiological processes always correspond to mental processes, provided a background for its empiristic, materialistic and neuro-physiological elaboration. On the legacy of Spinoza’s “imitation of affects” in modern philosophy see Scribano (2015 141ff.). On Spinoza and contemporary neurosciences in general see e.g. Damasio (2004).

Michael Arbib, and Michael Tomassello – who defend the hypothesis of a gestural origin of language.⁹

The separation and disconnection of language functions and their possible replacement had been already investigated in the pioneering research of Aleksandr Luriiia, which introduced a case of peculiar interest for our purposes: the distinction of writing and speech. In his book *The Man with a Shattered World* (1971), Luriiia tells the story of a Soviet soldier of the Red Army, Lev Zasecij, who was shot to the head by a bullet in the Second World War, and of his lifelong efforts to recover from his wound. In spite of being hardly able to speak and remember, Zasecij managed to write a 4000 pages diary over the years, arguing that while writing he was able to recover lost words and memories, and eventually even some ability to speak.

“By working on that one story of mine every day—even small amounts at a time—hoped I’d be able to tell people about this illness and overcome it.

I’ve already worked on the story of my illness for three years. Writing about and studying myself is my way of thinking, keeping busy, working at some-thing. It reassures me, so I keep at it. By doing it again and again (I don’t know how many times I’ve rewritten this over the years), my speaking ability has improved. I really do speak better now and can remember words that were scattered into bits and pieces by my head wound. By training myself (through thinking and writing) I’ve gotten to the point where I can carry on a conversation—at least about simple, everyday matters” (Luriiia 1987, 85).

Inspired by Luriiia’s approach – that he called a “Proustian neurology” – Oliver Sacks would tell a number of stories of patients with various neurological pathologies, who were able to recover a fair amount of control over their activity by means of different experiences, such as acting and playing. In the light of contemporary neurosciences, these stories can be better appreciated: for example, the investigation on the separation and connection of reading, writing and speaking has led to the discovery of the “reading area” (Dehaene 2009). On the whole, language appears as a set of capacities that can be mainly related to different material bases and at the same time are reciprocally connected and coordinated. Many philosophers and scientists had already argued, since the 19th century, that this connection corresponded to a mechanism that concerned the “whole brain”,¹⁰ and this view is supported today in leading neuroscientific theories of consciousness, such as the Global Workspace Theory, which conceives of consciousness as a consequence of the “broadcasting” of local and specialized information in the brain network.¹¹ This spatial and functional coexistence, which can be compared to the cooperation of instruments in the production of a symphony, leaves open the issue of the evolutionary origin of the different functions.

6. Narrative, literacy and prehistoric caves

In the preceding sections I have connected the hypothesis of the gestural origins of language to investigations of neural correlates of language. The mirror neurons provide a solid underpinning for this view, but this discovery does not fully address the evolutionary theory of language yet, that is the problem of evaluating whether there is a functional and/or

⁹ As we will see in the final section, neurological evidence could be connected to paleontological evidence in this regard.

¹⁰ See. e.g. Lange (1875, 343-4).

¹¹ For an exposition and defense of this theory see Dehaene (2014).

temporal precedence of, e.g., gesture and the inscription of signs over speech, or a precedence of the production of sounds over gestures, etc.. In particular, in the context of this paper, we are interested in learning more about the precedence of orality over writing in ancient storytelling. In this final section I will briefly examine this point.

I will start from the acknowledgment that some form of narrative is a condition for the existence of the human self. Many scholars, notably Sacks, Paul Ricoeur and Dennett, have argued that self-consciousness is related to memory and the construction of a personal narrative or “narrative identity” and this suggests that a social context of communication might well be a necessary condition of the human self, and, in turn, of narrative.¹² This hypothesis has been positively received by neuroscientists such as Damasio (1999) and Joseph LeDoux (2003). Vygotski and Luria already maintained that social interaction interacts with the structural evolution of the brain. As Luria put it, “Social history ties the knots that produce new correlations between certain zones of the cerebral cortex.”¹³ However, these views do not explain whether there is an original form of communication, since basic narratives of the “autobiographical self”, in spite of the fact that we associate these words with orality and writing, might be constructed in memory out of gestures and pictures. Indeed, as Dehaene (2011, 24) has pointed out by comparing the brain of literate and illiterate people, the “reading area” in the brain “specializes for visual object and face recognition before committing to visual word recognition”.

A tempting way to deal with this issue is to turn to paleontology. Indeed, the seminal researches of André Leroi-Gourhan aimed precisely at providing paleontological evidence that gestures preceded speech. On Leroi-Gourhan’s account, in the two volumes of *Gesture and Speech (Le geste et la parole, 1964-1965)*, the transition to bipedality in human evolution freed the hands for grasping and modeling rocks and other material into tools, and it also freed the face for gesturing and speaking. The development of the technology and language – as well as the parallel development of the cortex – all followed from the adoption of the upright stance. This approach had the advantage of considering the different operations and skills that are connected to the rise of creativity in the light of the history of the whole body in its interaction with the environment, thus avoiding the restrictive consideration of the brain and its “software” that has been lately denounced as a limit of neuroscience.¹⁴

Nevertheless, even if we take for granted the primacy of simple gesture acts of communication, the problem of the original way of sharing narratives is far from being settled. Indeed, I submit, the very question of an *original* form or function, in this context, may be ill-posed. A good perspective on this matter is given by the study of prehistoric cave paintings, such as those in the Chauvet cave, which count as possibly the most ancient work of pictorial – figurative and dramatic – representation of humans. A number of conjectures have been made on the meaning and the original context of these paintings. Some scholars have argued that the pictures might have been produced in a religious context and possibly accompanied by shamanic rituals and out-of-body experiences (Lewis-Williams 2002). Justin Smith has recently reviewed these hypotheses, concluding that we can make a more basic assumption:

“Scholars have shied away in recent decades from the view that this preoccupation with animals, and with their artistic representation, amounted to a magical practice, or to ritual invocation of the

12 See Sacks (1985); Ricoeur (1990); Dennett (1991). See Pecere 2020a for an overview.

13 Luria (1978, 279). Cf. Malafouris (2010): “Our minds and brains are (potentially) subject to constant change and alteration caused by our ordinary developmental engagement with cultural practices and the material world.”

14 See e.g. Damasio (1994), 247–250.

spirits of the beasts for shamanistic purposes. It is just as likely that the representations were supplements to a cultural practice of storytelling, aided by images that appeared to move along the walls under the flickering flame, for no other reason than that cave artists were, as we are, members of the species *Homo narrans*: people who tell stories.” (Smith 2018).

Be that as it may, we can conjecture that the original setting of production and observation of these works entailed some kind of communication. We may take some of these paintings as primitive forms of narrative. E.g. where a herd of horses are represented, the different figures form a kind of time-lapse, which, in turn, represents a basic representation of a scene of riding horses. At the same time, the mixture of anthropomorphic and animal shapes suggests an incipient, creative reflection on the nature of different kinds of being, including humans. The joint awareness of successive events and the human self in question seems to provide the basic elements of a story. Whether this story was actually *told*, in the presence of these paintings, is not sure, but it is most likely that, as soon as a first attempt at this storytelling was made, both gestures and sounds might have been used to point to, describe and connect the pictures. This suggests that an originary connection of visual, gestural and auditory signs might have been the material background of narrative, long before orality and literacy emerged.

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