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Studi

Cognitive Foundations of the Narrative Self*

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Abstract In this paper we tackle the issue of the role of narrative language in the constitution of human subjectivity. There are at least two different approaches to this issue. The first one is consistent with the view that language has a unique constitutive role in cognition. According to this account, human subjectivity is a by-product of the advent of language. We will refer to it as *linguistic idealism* and will argue that, in spite of its popularity in the philosophy and social sciences, this view is completely unfounded. We will defend a second approach, which acknowledges the relevant role of language in human subjectivity but interprets this role in the light of a relation of coevolution between language and cognition. We will suggest that this relation is asymmetric and the priority is given to the cognitive foundations of human sense of the self. The influence of language on human subjectivity is then analyzed in terms of a retroactive effect. We will argue that the relation of coevolution between language and cognition provides an interpretative tool that allows us to account for human subjectivity in accordance with darwinian naturalism.
KEYWORDS: Language; Narrative Self; Mental Time Travel; Metarepresentation.

Riassunto *I fondamenti cognitivi dell'identità narrativa* – In questo articolo affrontiamo il problema del ruolo che il linguaggio narrativo svolge nella costituzione della soggettività umana. Vi sono almeno due differenti approcci a questo problema. Il primo approccio si basa sull'idea che il linguaggio svolge un peculiare ruolo costitutivo nella cognizione; in quest'ottica, la soggettività umana è un sottoprodotto dell'avvento del linguaggio. Definiremo questa tesi "idealismo linguistico" e sosterremo che, malgrado la sua popolarità in filosofia e nelle scienze sociali, è completamente priva di fondamento. Difenderemo allora un secondo approccio, che riconosce il ruolo significativo del linguaggio nella soggettività umana ma lo intende alla luce della relazione di coevoluzione fra linguaggio e cognizione. Questa relazione è asimmetrica: la priorità va assegnata ai fondamenti cognitivi del senso di sé umano. L'influenza del linguaggio sulla soggettività umana sarà quindi analizzata come effetto retroattivo. La nostra conclusione è che la relazione di coevoluzione fra linguaggio e cognizione offre uno strumento interpretativo che consente di spiegare la soggettività umana in accordo col naturalismo darwiniano.
PAROLE CHIAVE: Linguaggio; Identità narrativa; Mental Time Travel; Metarappresentazione.

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Old and new idealisms

The thesis that language is the core constituent of human subjectivity is widely shared in philosophy and the social sciences. An influential account of the self has been defended by Dennett, who argues that human subjectivity has to be interpreted as a *center of narrative gravity*:

> And just as spiders don't have to think, consciously and deliberately, about how to spin their webs, and just as beavers, unlike professional human engineers, do not consciously and deliberately plan the structures they build, we (unlike professional human storytellers) do not consciously and deliberately figure out what narratives to tell and how to tell them. Our tales are spun, but for the most part we don't spin them; they spin us. Our human consciousness, and our narrative selfhood, is their product, not their source.[2]

Dennett's account of subjectivity is actually based on a more general idea of the relation between thought and language. More specifically, this view is consistent with the idea that language has not only a communicative function but also a cognitive function: it does not only express thoughts, it also constitutes thoughts. The strongest version of this idea is the so-called Sapir-Whorf hypothesis, based on determinism and linguistic relativism. Although almost no one defends the classical version of this hypothesis anymore, updated and revised versions of it have taken its place. Some versions of the "extended mind" hypothesis rely on similar grounds.

According to Clark, the mind extends outside the skull: the external environment, in this perspective, acts as a "scaffolding" for cognitive processing, an "external support" by which the brain unloads its computational burden.[3] An intuitive example of this form of scaffolding is represented by the pen and paper used to cope with calculations which are difficult to resolve otherwise: while external to the mind, pen and paper become in this case part of the cognitive devices used by humans to solve certain cognitive tasks. Dennett is another supporter of the extended mind hypothesis. Both authors agree that language is a decisive external support of mental activities:

> Of all the mind tools we acquire in the course of furnishing our brains from the stockpiles of culture, none are more important, of course, than words – first spoken, then written. Words make us more intelligent by making cognition easier, in the same way (many times multiplied) that beacons and landmarks make navigation in the world easier for simple creatures.[4]

In order to understand the idea of subjectivity as a "center of narrative gravity", it is necessary to focus on the notion of the constitutive role of language in thought. This involves focusing both on a certain hypothesis on the nature of thought and on the nature of language. Dennett's thesis is based on a specific hypothesis concerning what language is. In sharp contrast with the thesis that language expresses the intention of the speaker, Dennett comes to a radical hypothesis about the nature of verbal processes. In his view, there is no communicative intention prior to its verbal expression: the intention is rather a product of language.

Dennett's criticism of the myth of original intentionality emerges from the contrast between two interpretative schemes: the *Pandemonium Conceptualizer* and the *Bureaucratic Formulator*. The classical model of linguistic communication – the code model – is a bureaucratic model. The internal boss thinks about something to say and the bureaucracy of the language is in charge of saying what the boss has thought.

In the *Pandemonium* model, instead, the communicative intention of the speaker is

just the final product of a competition (governed by a form of natural selection) between many words which struggle to obtain a place in the utterance. In a model of this type, the communicative intention of the speaker is unknown to the speaker himself until the utterance is actually expressed.

As Dennett points out,

> [i]n the normal case, the speaker gets no preview; he and his audience learn what the speaker's utterance is at the same time.[5]

Communicative intentions are therefore essentially the result (and not the condition) of the verbal expression.

Dennett's proposal is clear: the relevance of the internal components of the mind is weakened by emphasizing the role of the external factors. Language is the most important of these external factors. The main purpose of his proposal is to rely on a poor and unstructured cognitive architecture in order to maintain a precise theoretical option concerning the nature of the mind: a model of cognition focused on the pervasive role of language.

Dennett's idea is that the most relevant properties of human cognition can be explained according to a process of "internalization" of external structures which proceeds in a unidirectional manner "from the outside towards the inside".

Because of the constitutive dependence of cognition on language, the most important properties of human mind come to assume an "all-or-nothing" character: either one has a language or not and, consequently, either one has certain cognitive abilities that are the product of language or not. The all-or-nothing character of this proposal qualifies Dennett's thesis as a form of linguistic idealism: since humans are the unique animals able to speak, it follows that a number of properties that depend on language belong exclusively to our species.

Against linguistic idealism, in this paper we will use a two step argument. Specifically, we will show that some of the properties supposed to be at the basis of human subjectivity do not depend on the constitutive role of narrative language, for the following reasons: (1) these properties exist in forms that are completely autonomous and independent of any typ of verbal skill; (2) these properties represent the preconditions for the evolution and origin of language, that is, without such properties language would not have the structure it actually has.

This two step argument leads us to conclude that the role of language in thought has to be conceptualized in terms of a relationship of co-evolution based on the asymmetric dependence for which cognition, both logically and temporally, always precedes language. Such a conclusion allows us to criticize linguistic idealism and tackle the issue of the role of narrative processes in human subjectivity in the context of a naturalistic and evolutionary perspective.

In the next sessions we will test the two step argument examining two cognitive skills involved in the construction of human subjectivity: the ability to process metarepresentations and the ability to think about past and future events.

Is metarepresentation a product of language?

Self-reflective thought is rightly regarded as one of the basic conditions for the construction of the self. According to Clark, the role of language in this construction is exemplified by the idea that meta-reflection depends on human specific communicative abilities:

> This "thinking about thinking" is a good candidate for a distinctively human capacity – one not evidently shared by the non-language using animals that share our planet. Thus, it is natural to wonder whether this might be our entire species of thought in which language plays the generative role – a species of thought that

> is not just reflected in (or extended by) our use of words but is directly dependent about language for its very existence.[6]

Given that the "thinking about thinking" involves the use of metarepresentational structures, an important preliminary step is to investigate whether metarepresentation is exclusively a product of language. Dennett responds affirmatively to the question.[7] Clark and Dennett are in perfect harmony in recognizing the role of language (like an external artifact) in the construction of the representational structures at the foundation of the kind of reflective thought that both authors consider the most important feature of humans beings.

It is worth emphasizing that – appealing to the role of languages (and not to a language faculty) – both Dennett and Clark accomplish a further step in recognizing the primacy of external cultural factors. In their opinion, reflective thought could not exist without a public (and as such external) language. According to Dennett, in fact, metarepresentations are the result of "shared thought":

> What stikes me as clear enough is that there is *one* pathway to such florid thinking about thinking that moves from the outside in. It begins with overt, public use of symbols and tokens of one sort or another (spoken words will do, perhaps, but only if they are used self-consciously), and creates practices that later can be internalized and rendered private. Since chimpanzees, for instance, lacking language, cannot play these external games any more than lions can, they cannot use *this* path as a route to private or covert thinking about thinking. This line of thought fits handsomely with the recent emphasis by Andy Clark, and indeed by me (in *Kinds of minds*), on the claim that *minds are composed of tools for thinking* that we not only obtain from the wider (social) world, but largely leave in the world, instead of cluttering up our brains with them.[8]

This idea of a single pathway that "moves from the outside in" is at the basis of the idealistic vision of the role of language in thought. Criticizing this form of idealism we do not intend to question the importance of the role of language: what we intend to discuss is the idea that language is the unique condition of thought.

Our proposal provides an interpretation of the role of language in thought in line with the continuist commitment that a reflection on subjectivity has to maintain in a naturalistic account of human beings.

Metarepresentations without language

The first step in undermineing linguistic idealism is to prove the existence of forms of thought without language. For what is at issue in this paper, a good way to demonstrate such a form of thought is to prove the existence of metarepresentational abilities in non linguistic organisms.

Premack and Woodruff gave rise to the debate on Theory of Mind in chimpanzees.[9] Their experiment was subjected to a series of criticisms that questioned the results, the theoretical assumptions and the methodology. The basic problem is well summarized by Premack according to which an individual can reach a social relationship with another individual in two distinct ways: by directly modifying the individual's behaviour; or by modifying the individual's beliefs in order to act on her behaviour. Only this second case represents a proof of theory of mind.[10]

Gozzano argues that "tactical deception" is a compelling way to settle the question about the theory of mind of non-human primates.[11] According to Byrne and Whiten, an important distinction to make is between a "first level" of deception that is characterized by an intentional behavior (the intention to reach a goal that can be achieved only by deceiving an individual) but lacks the "intent to deceive"; and a "second level" of deception characterized by the presence of such an intention.[12]

According to this distinction, in order to have the second level of deception it is necessary that the animal 1 wants (the animal 2 to believe that X) where X is false. Obviously, only the second level of deception guarantees the existence of a theory of mind.

The question here is whether the experimental data are consistent or not with the hypothesis that non-human primates are capable of this level of deception. For the two authors the answer is yes: chimpanzees are able to implement behavioral strategies that require the second level of deception. The most interesting cases in this respect are those involving the ability to "answer a deception with another deception".

Another interesting case is that of a chimpanzee grappling with another who refused to communicate information relating to an area with food: the first chimpanzee pretended to leave but as soon as he was out of sight, he hid behind a tree and began to spy on the other.

This behaviour, according to the two authors, reveals the attempt to deceive, but especially it suggests that an adult chimpanzee who hides himself has to have understood the other's attempt to deceive.

Although the debate on the attribution of theory of mind to non-human animals remains controversial, it seems that the view according to which language is a necessary condition for metarepresentation cannot be supported by experimental results: apes seem to succeed in tasks that require metarepresentational capacities, and apes do not talk.

A point to be emphasized here is that claiming that apes show metarepresentational skills it is not equivalent to claim that apes possess the same metarepresentational skills used by humans.

That said, the most significant result of the empirical research on apes is the criticism of the idea (characterizing the "linguistic idealism") that metarepresentations are all-or-nothing. As we will see in the next section, human ability to use metarepresentations is just a matter of degree.

Metarepresentational continuism

Suddendorf and Whiten gave a relevant contribution to the study of the phylogeny of metarepresentations arguing that it is possible to include the issue in the framework of a continuistic perspective.[13] The key point of their argument is the identification of a specific kind of representation which ensures the evolutionary transition from the level of primary representations to the level of full metarepresentations. The authors follow Perner in arguing that "secondary representations" can be interpreted as an intermediate level that allows children (by the age of two) to build a "mentalistic theory of behavior" before they can exploit a proper "representational theory of mind".[14]

The question asked by Suddendorf and Whiten is: can we attribute this intermediate level even to apes? After having reviewed numerous studies on the topic, the authors argue that the dichotomy between having or not having a theory of mind should be abandoned and in this way they maintain a form of metarepresentational continuism.

Following Perner, three different representational systems can be distinguished to describe the ontogeny of child's representational skills: the primary representations (those directly related to the perceptual system); the secondary representations (those that allow cognitive operations that go beyond the actual reality); the metarepresentations in the full sense (those that allow the child to metarepresent representations as representations).[15]

According to Suddendorf the same distinction can be applied in the case of phylogeny as well: with primary representations one individual simply perceives the actions of other individuals; with secondary representations she can interpret the behavior of others in terms of not directly perceptible mental states such as desires whereas epistemic states such as beliefs are still excluded at this level; with metarepresentations in the full sense individuals can appreciate the representational nature of the mental states.

While the secondary representations provide multiple models of reality, which can be compared to each other (Suddendorf calls "collating mind" the processing system involved in the use of this representational level), it is just through the use of metarepresentations in the full sense that individuals can build metamodels, namely models able to represent not only other representations but also the representational relationships between these representations.

The basic character of secondary representations – which are particularly relevant within a continuistic perspective – is the ability to *decouple* the representation from the perception of the actual stimulus (the decoupling that Leslie puts at the origin of pretend play). This capacity allows new cognitive skills. The most important is the ability to think, through the production of alternative models, about possible worlds which are different from the real world in which individuals are situated.

The properties of a cognitive system that makes use of secondary representations emerge for difference from the properties of a cognitive system that uses only primary representations. Detaching individuals from the situation actually perceived, a collating mind is a cognitive device that, producing a variety of alternative models of the scene represented, enables individuals to behave flexibly.

Empirical evidence for secondary representations comes from the comparative psychology, as well as from the developmental psychology. Suddendorf and Whiten have shown that apes use secondary representations for a variety of tasks, including tactical deception, imitation and empathy.[16] Given that chimpanzees, orangutans and gorillas show abilities (such as pretend play or deception) that children reach during the second year of life, it can be concluded that apes and children of this age share a collating mind and that both are able to use secondary representations.

As a result of these considerations, we can then hypothesize that some representational structures, which are distinct from metarepresentations in the full sense, are functionally and structurally more powerful than primary representations. Such a result gives us the opportunity to consider metarepresentations in terms of degrees (they are not an all-or-nothing phenomenon) and, thus, to analyze them in a continuist account.

The idea of a metarepresentational continuism leads us also to another result, that is the opportunity to consider the secondary representation as a pre-condition of the meta-representation in the full sense. Considering the relevance of this result for the debate concerning the relation between language and thought, secondary representations have to be considered as the litmus test of the continuist hypothesis.

Metarepresentation precedes language

In the previous section we proved the independence of metarepresentations from language. This result allows us to perform the second step of our argument: to demonstrate that without a metarepresentational system human language would not be possible. The first move to do is to analyze what we have to intend by "language" in this context.

A good way to face the problem is to study the transition from animal communication to human language. Animal communication is easily interpreted in terms of the so-called "code model", a concept of communication founded on the mathematical information theory of Shannon and Weaver.[17]

According to the code model, the thoughts (i.e., the message) are encoded by the speaker in a succession of sounds that the listener decodes in order to share the thoughts that the speaker has intended to communicate. Even though it makes sense to consider the code model as a model of animal communication, it is totally misleading to consider it as a good model of human language.

The strongest reason is the fact that, as evidenced by Sperber and Wilson,[18] human

language is founded on the crucial Gricean distinction between "speaker meaning" and "sentence meaning". In the case of human language, the difference between what the speaker says and what she intends to say represents the key to understand what differentiates human language from animal communication. For example, let's consider the case of irony or metaphor. When someone says "This chair is as comfortable as sitting on nails", it is plausible to assume that she does not want to communicate that sitting on nails really is comfortable.

How it is possible to understand (despite the meaning of the sentence actually uttered) what the speaker really intended to communicate with this utterance?

We have no other way than referring to the intentions of the speaker: to do this, humans have to possess a sort of "mindreading" device – a cognitive system able to use metarepresentational structures. Empirical evidence of the role of mindreading in language comprehension and production processes is offered by the pragmatic deficit of autistic individuals, who struggle to understand metaphorical and ironic expressions.[19]

These considerations allow us to deal with the question of the relation between language and metarepresentation from a new perspective. Sperber provided an interesting contribution to the debate, analyzing the topic of the origin of language.[20] He proposed a twofold possibility.

On the one hand, if we consider ancestral communication as a form of communication which is somehow equivalent to human modern coommunication (as the simplest form of modern communication), it must be admitted that ancestral communication has to be interpreted in terms of the same mechanisms operating on human communication. In this case, however, considering that to explain the ancestral communication we must "presuppose" the existence of forms of metarepresentation, language cannot precede metarepresentation.

On the other hand, if we consider ancestral communication, unlike modern human communication, as a form of communication based on the code model then it is not possible to recognize in our ancient ancestors the necessary condition

> to become aware of the representational character of their signals anymore than bees or vervet monkeys do.[21]

In this way human language could never emancipate itself from the forms of animal communication anchored to the code model:

> If the ability to communicate linguistically had preceded the ability to use metarepresentations, then this pre-metarepresentational, ancestral verbal ability would have been radically different from the kind of verbal ability we modern humans use, which is metarepresentational through and through. The ancestral language would have been a coding-decoding affair as are that many forms of non-human animal communication of which we know. This, in itself, is an unattractive speculation since it implies a radical change in the mechanims of human linguistic communication at some point in its evolution.[22]

The metarepresentation is a necessary condition for the origin and functioning of language. Origgi and Sperber maintain:

> The function of linguistic utterances, then, is – and has always been – to provide this highly precise and informative evidence of the communicator's intention. This implies that language as we know it developed as an adaptation in a species already involved in inferential communication, and therefore already capable of some serious degree of mind-reading. In other terms, from a relevance theory point of view, the existence of mindreading in our ancestors was a precondition for the emergence and evolution of language.[23]

The conclusion of this first part is that metarepresentation (and the ability to mentalize) is a logical and temporal precondition for the advent of language. Given that without metarepresentations there would not be language, human communication cannot be considered the necessary condition for metarepresentations (contrary to linguistic idea-lism).

Since the ability to metarepresent is considered a basic requirement of self-reflective capacity, the result of this first part is that self-reflection is a characteristic of human beings that cannot be interpretated in reference to linguistic idealism. The two-step argument used by us to criticize this form of idealism in the case of metarepresentational capacity will now be applied to the discussion of the crucial issue of human subjectivity.

Reflective thinking and the challenge of subjectivity

When Jerry Fodor was asked what was the role of consciousness in his work, it is known that he replied that it consisted mainly of a "Come on Jerry. It is like that Jerry. You can do it!". Although Fodor's answer was meant to suggest that consciousness does not have any relevant role in his philosophy, his answer is not unproblematic given that the problem of a theory of consciousness is, in fact, to explain how some contents, relatively few, come to the awareness while most of the others remain in the oblivion.

The explanation proposed by Dennett is the theory of the "Fame in the brain", heir of the *Model of Multiple Drafts*.[24] According to this theory, consciousness resembles fame, a sort of relative "political" power conquered by some contents during the competition for the control of the body. A theory of consciousness has to explain, then, in which way certain contents obtain this power and manage to monopolize attention.

Dennett's idea is that some contents become aware in the same way in which some people become famous: what matters is the debut's follow-up. Specifically, the relevant part is the ability to create echoes of the event, that is, re-enactments or reverberations.

It should be noted that a past event can determine the current behavior of an individual without involving any explicit recall of the event itself. For example, a dog can recognize his master's smell without assuming that the smell awakens in him a memory of some past event. The smell could determine the behavior of the dog simply awakening a "visceral" joy associated with an event – without the past event being lived again in the dog's mind.

The point is particularly significant for the general issues addressed in this book; the question under discussion is the dog's ability to remember, that is to create a reflective memory of the event. This is a crucial question given that, according to the theory of consciousness as fame, if an organism is capable of creating such reflective episodes then he is conscious as humans are.

Dennett believes, in fact, that humans' ability to recreate events in their minds is the most important feature of consciousness – the closest essential property of consciousness to which we could ever get. It is worth noting that this is actually an empirical hypothesis and it should be treated as such.

Dennett also proposes a second empirical hypothesis, which concerns the way in which the ability to recreate events in the mind is acquired. In his account, the talent to replicate events in our mind is the result of a specific habit learned within a certain culture: the echo systems through which events are replicated are in fact memes. The relevance of reflective thinking for consciousness is in agreement, then, with his notorious statement that human consciousness is largely a "machine of memes" culturally transmitted.

According to Dennett, consciousness exists only in this dimension brought to the public by our echo-capacity, which is determined by the intertwining of memes within narratives.

Our objection to Dennett's theory concerns exactly this second empirical hypothesis. We will show that the ability to reflect on

past events, which plays such a critical role in his theory, does not depend on language. On the contrary, language itself relies on pre-existent self-reflection. The first step of our argument is to specify that the ability to re-live past events – also known as episodic memory – is just a part of a wider mental faculty which also includes the ability to pre-experience future events.

This faculty has been called mental time travel and it plays a crucial role in the constitution of personal identity.[25]

Mind's power to travel in time

The relation between memory and personal identity is a traditional theme of philosophical inquiry. The connection between future-thinking and personal identity has by contrast been less investigated.

Let's consider, though, what would happen to our sense of ourselves if we lost the ability to project to the future. Without our projects, our expectations and hopes, we would be completely detached from a huge part of what anchors the sense of who we are and where we are going. It might be objected that the way in which the future constitutes our personal identity is only similar to the way in which the past shapes the sense of ourselves. One could argue that there is a relevant asymmetry between the two dimensions given that the future, unlike the past, has not been experienced yet.

However, the difference between thinking-about-the-future and thinking-about-the-past becomes less stringent if one considers that both are the product of a process of construction. The classical locus of the constructive theory of memory is Bartlett,[26] but the most clear explanation of this theory is provided by Neisser when he compares the act of remembering to the work of a paleontologist, who tries to reconstruct the entire skeleton of a dinosaur starting with only some fragments of bones.[27]

The constructive nature of memory is confirmed by common mistakes which we all incur. Distortions, illusions and false memories do not signal a malfunctioning system; they rather reveal the nature of the processes involved and the functional basis of episodic memory.

The latter is constructive because its main function is not to provide an accurate record of the past, but rather to provide elements which can be later used to simulate scenarios that may occur in our personal future. Since the future is not an exact repetition of the past, an effective anticipation has to rely on a system that can extract information from the past and flexibly recombine elements of previous experience within new representations.

Recently, a growing number of studies have confirmed that the projection to the future depends on the same cognitive and neural processes that are involved in remembering the past.[28]

These findings have led to reconceptualize episodic memory in the context of a more general capacity for *mental time travel* (MTT). In the light of that, we believe that in order to investigate the processes involved in the emergence of personal identity we have to consider this broader capacity as a whole. Thus, the following paragraphs have a two-fold aim. First, we will apply the previously introduced argument for the independence of reflective thinking from language to the specific form of self-reflection involved in the emergence of human subjectivity. This will involve showing that MTT is independent from language. Second, we will argue that MTT plays a relevant role at the foundation of language itself.

Are animals stuck in time?

Episodic memory is subsidiary to the ability to simulate future scenarios, as its main function is to allow the individual to anticipate future needs. Most humans' activities are indeed oriented to fulfill needs that are not experienced yet but only anticipated. The question is whether other animals do that as well.

According to the Bischof-Köhler hypoth-

esis, non-human animals are limited to the here-and-now, and hence their actions are not guided by the simulation of what might happen in the future.[29] One could argue that the behavior of many species disproves this hypothesis, as birds build nests, beaver build dams and many other animals act in preparation for the winter although they have never experienced the cold season. Although this reasoning is correct, it should be noted that these examples simply reveal innate predispositions or behaviors acquired through training or trial and error.

The Bischof-Köhler hypothesis does not discuss the existence of this type of future-directed behaviours. The claim is rather that animals are not capable of more flexible behaviours, which involve the ability to act according to a mental representation of the future (foresight). Specifically, the behavioural criterion for attributing to an animal the ability to plan for the future is the dissociation of his own current needs from the anticipated future ones.

Interestingly, some birds have been shown to be able to anticipate the unfortunate situation of not being served breakfast the next morning in a certain room, and this is why they hide some food in that room the day before, even though they are not hungry at the moment of caching.[30] Although this behaviour seems to indicate some degree of flexible foresight, it has been noted that birds' farsighted decision is restricted to the domain of food-caching, which is a species-typical behaviour possibly determined by a combination of innate predispositions and acquired behaviors.

So far, great apes seem to be the best candidates for MTT in other animals. As already said before, they have the ability to use secondary representations, thus they can detach from the present and project to imagined worlds, including past and future scenarios.

Mulcahy and Call found that bonobos and orangutans were able to select the appropriate tool to operate a device that dispensed grapes;[31] later on, they carried the tool in a waiting room, where they were to spend several hours before being allowed to go back to the test-room in which the device was placed. After this interval, most of them remembered to bring the tool back to the test-room, thus indicating that they were anticipating a future need. However, some caution is required in interpreting these results in terms of an ability for MTT. Suddendorf has argued that it is not clear whether the apes were actually anticipating the need for the tool or a future motivational state of hunger.[32]

Given the current state of the art, it is not possible yet to make certain claims about the extent of apes' ability for MTT. In spite of that, their performances on several related tasks reveal at least that human ability for MTT has precursors in other animals. Even this weaker conclusion is enough for our more general aim: if other animals are capable of at least some forms of MTT thus, given that other animals do not speak, MTT is not a by-product of language.

This is sufficient for our first step, the independence of mental time travel from language. We can now proceed with the second step, showing the role of mental time travel in language.

Representing events in language

In this paragraph we will argue that MTT has a key role in language because it is involved in the process of grammaticalization that led to verbal communication.

The term "grammaticalization" refers to the process by which some expressions came to acquire a grammatical function. The emphasis on the role of grammaticalization in language evolution coincides with the emphasis on the role of linguistic change. The motor of the process is the individual speaker, who gives rise to an active interaction between language structure and language use. Empirical evidence of the role of this process in the evolution of language comes from the case of Nicaraguan Sign Language (NSL).

Without any exposure to a structured language, in the course of about twenty-five years (starting from the opening of a school for deaf children) a transition from a form of gestural communication to a linguistic system of signs was observed in the Nicaraguan deaf community. Nicaraguan Sign Language offers then a rare opportunity to investigate how fundamental properties of language emerge in the transition from non-linguistic to linguistic.

A study by Senghas and colleagues compared the expressions produced by groups belonging to different generations in order to find out how the combinatorial structure of the language is acquired.[33] The analyzed expressions consisted of descriptions of complex events of movement, for example, "rolling down a slope". Such events include a manner of movement (roll) and a path (descending) which are simultaneous aspects of a single event, experienced holistically. The interesting fact is that the older group represented manner and path in a single gesture; the majority of the subjects in the two younger groups used, instead, two gestures assembling them within a sequence of elementary units.

The youngest subjects showed, therefore, the segmentation and linearization typical of structured languages, despite the fact that these characteristics were absent in the input from the surrounding environment. The hypothesis of Senghas and colleagues is that in the course of successive generations, children made this segmented construction the preferred way to express motion events, such that NSL quickly acquired the discrete and combinatorial nature typical of language.

We should note that this change in language structure causes at the beginning a loss of information, given that when manner and path are expressed separately it is no longer iconically clear if they are two components of a single event or describe two different events (rolling and *then* descending).

However, the communicative power acquired by means of the new combinatorial structure compensates for the potential ambiguity. The segmented elements and the ability to put them in sequence provide the building blocks for complex linguistic constructions (phrases and sentences), the structure of which conveys a meaning that exceeds the simple addition of the individual parts. For example, in NSL simultaneity is expressed through a specific pattern of structured sequence. Hierarchical combinations are critical for language, because they allow us to produce endless expressions with a finite set of elements.

The process of grammaticalization that allows the transition from a gestural system of communication to a sign language would not have been possible, according to Suddendorf and Corballis, without a system to analyze complex events and break them down into constituents. MTT played this function.[34]

The key idea is that events were initially only represented in an holistic way and kept in memory as unitary structures. The emergence of MTT allowed individuals to represent events in a more flexible way as new combinations of already known elements. In this way, the particularities of each event could be taken into account by breaking the events down into their constituent parts and remembering them as different combinations of the same elements.

The core argument for the role of MTT in language is that language evolved to communicate about specific events that occurred at a certain time and in a certain place.

In order to efficiently fulfill this function, the structure of language has evolved to reflect the structure of thought. At least in part, therefore, the structure of language depends on the formation of a combinatorial system to represent events. Given that MTT gives the representation of events a combinatorial structure, it thus also gives language a combinatorial structure.

This line of reasoning is consistent with a more general idea of the relation between thought and language that challenges lingui-

stic idealism. In particular, since the ability to reflectively think about events is the most important feature of personal identity and since language is dependent on this form of self-reflection, it follows that language cannot be considered the only constituent of personal identity. From this reasoning it does not however follow that language has no significant role in the constitution of personal identity.

On the contrary, we have already argued that, once acquired, language significantly affects thought. If our argument for the cognitive foundation of language was successful, we are now in the position to acknowledge that this role has to be interpreted in terms of a retroactive effect. In the last paragraph, we present a specific hypothesis about the cognitive retroactive role of language in personal identity.

Narrative identity

The bi-directional relation between language and thought is an asymmetric relation. Language acquisition and evolution relies on a network of cognitive faculties, among which MTT plays a particularly relevant role. Once language is acquired, though, it retroactively affects thought.

In particular, we agree with the sociocultural tradition that narrative language significantly contributes to shape personal identity. Given the asymmetric relation we have argued for, however, ackwnowledging the role of narrative language does not imply any form of linguistic idealism.

Dessalles provides an interesting interpretation of the role of language, identifying some constraints that the representation of events has to respect for the events to be narratable.[35] Specifically, the narratability of the events is judged in the light of two crucial properties: the stories should be unexpected and atypical. These properties can be understood, according to the author, as a means to influence the cognitive complexity of the stories: the lower the complexity, the greater the interest, because the events seem more unexpected and atypical.

The relevant point is that narrating an event is not simply a means to communicate some unaltered contents. Given that there are some constraints in narrating a story, the fact of narrating it affects the way in which one thinks about the narrated events. The constraints discussed by Dessalless tend to illustrate the social function of the narratives. Individuals spend a fifth of their awake time in spontaneous conversations[36] and a significant portion of these conversations concerns past events.[37] The commitment to tell stories is so considerable because those who succeed in eliciting the interest of others are preferred in establishing bonds of solidarity, because they show more informational capacity and experience in facing unexpected events.

Other authors have emphasized that strictly linguistic constraints and narrative conventionality also play a significant role in shaping the representation of events, for example the rules of enunciation which the narrator must comply with and which are responsible for producing a good story.[38]

These constraints have epistemic value, because they can be used as a source of insight on the narrator's own experience, leading her to consider certain aspects in a new light. In this view, the stories we tell modify and articulate the contents they are about, to the point that narration is not anymore only a mode of communication but becomes a cognitive system in itself. Therefore, although the origin of the sense of self is independent from language, at this stage narrative language can finally come to play a constitutive role in personal identity.

Notes

[*] Although this paper is the product of a cooperative work, Erica Cosentino is particularly responsible for §§ 5-8 and Francesco Ferretti for §§ 1-4.

[2] D.C. DENNETT, *Consciousness Explained*, Little, Brown, and Company, Boston 1991, p. 418.

[3] See A. CLARK, *Being There*, MIT Press, Cambridge (MA) 1997; A. CLARK, *Natural-Born Cyborgs*, MIT Press, Cambridge (MA) 2003.

[4] D.C. DENNETT, *Kinds of Minds*, Basic Books, New York 1996, pp. 146-147.
[5] D.C. DENNETT, *Consciousness Explained*, cit., p. 138.
[6] A. CLARK, *Being There*, cit., p. 209.
[7] See D.C. DENNETT, *Making Tools for Thinking*, in: D. SPERBER (ed.), *Metarepresentations. A Multidisciplinary Perspective*, Oxford University Press, Oxford 2000, pp. 17-29.
[8] *Ivi*, p. 21.
[9] D. PREMACK, G. WOODRUFF, *Does the Chimpanzee have a "Theory of Mind"?*, in: «Behavioral and Brain Sciences», vol. I, n. 4, 1978, pp. 515-526.
[10] See D. PREMACK, *"Does the chimpanzee have a theory of mind" revisited*, in: R.W. BYRNE, A. WHITEN (eds.), *Machiavellian Intelligence: Social Expertise, and the Evolution of Intellect in Monkeys, Apes and Humans*, Oxford University Press, Oxford 1988, pp. 160-179.
[11] See S. GOZZANO, *Pensiero senza linguaggio. Comportamento e comunicazione animale*, in: D. GAMBARARA (a cura di), *Pensiero e linguaggio*, NIS, Roma 1996, pp. 15-48; S. GOZZANO (a cura di), *Mente senza linguaggio. Il pensiero e gli animali*, Editori Riuniti, Roma 2001.
[12] See R. BYRNE, A. WHITEN, *Computation and Mindreading in Primate Tactical Deception*, in: A. WHITEN (ed.), *Natural Theories of Mind*, Blackwell, Oxford 1991, pp. 127-141.
[13] See T. SUDDENDORF, A. WHITEN, *Mental Evolution and Development: Evidence for Secondary Representation in Children, Great Apes, and Other Animals*, in: «Psychological Bulletin», vol. CXXVII, n. 5, 2001, pp. 629-650; T. SUDDENDORF, A. WHITEN, *Reinterpreting the Mentality of Apes*, in: K. STERELNY, J. FITNESS (eds.), *From Mating to Mentality: Evaluating Evolutionary Psychology*, Psychology Press, New York 2003, pp. 173-196.
[14] See J. PERNER, *Understanding the Representational Mind*, MIT Press, Cambridge (MA) 1991.
[15] See T. SUDDENDORF, *The Rise of Metamind*, in: M.C. CORBALLIS, S.E.G. LEA (eds.), *The Descent of Mind. Psychological Perspectives on Hominid Evolution*, Oxford University Press, New York 1999, pp. 218-260, here p. 219.
[16] See *supra*, fn. 13.
[17] See C.E. SHANNON, W. WEAVER, *The Mathematical Theory of Communication*, University of Illinois Press, Champaign (IL) 1949.
[18] See D. SPERBER, D. WILSON, *Relevance. Communication and Cognition*, Blackwell, Oxford 1995 (II ed.).
[19] See F. HAPPÉ, *Communicative Competence and Theory of Mind in Autism: A Test of Relevance Theory*, in: «Cognition», vol. XLVIII, n. 2, 1993, pp. 101-119; F. HAPPÉ, *Understanding Minds and Metaphors: Insights from the Study of Figurative Language in Autism*, in: «Metaphor & Symbolic Activity», vol. X, n. 4, 1995, pp. 275-295.
[20] See D. SPERBER, *Metarepresentations in an Evolutionary Perspective*, in: D. SPERBER (ed.), *Metarepresentations. A Multidisciplinary Perspective*, Oxford University Press, Oxford 2000, pp. 117-137.
[21] *Ivi*, p. 122.
[22] *Ivi*, pp. 122-123.
[23] G. ORIGGI, D. SPERBER, *Evolution, Communication and the Proper Function of Language*, in: P. CARRUTHERS, A. CHAMBERLAIN (eds.), *Evolution and the Human Mind. Modularity, Language and Meta-Cognition*, Cambridge University Press, Cambridge 2000, pp. 140-169, here p. 165.
[24] See D.C. DENNETT, *Sweet Dreams. Philosophical Obstacle to a Science of Consciousness*, MIT Press, Cambridge, (MA) 2005.
[25] See T. SUDDENDORF, M.C. CORBALLIS, *Mental Time Travel and the Evolution of the Human Mind*, in: «Genetic Social and General Psychology Monographs», vol. CXXIII, n. 2, 1997, pp. 133-167.
[26] See F.C. BARTLETT, *Remembering*, Cambridge University Press, Cambridge 1932.
[27] See U. NEISSER, *Cognitive Psychology*, Appleton-Century-Crofts, New York 1967.
[28] For a review, see D.L. SCHACTER, D.R. ADDIS, *The Cognitive Neuroscience of Constructive Memory: Remembering the Past and Imagining the Future*, in: J. DRIVER, P. HAGGARD, T. SHALLICE (eds.), *Mental Processes in the Human Brain*, Oxford University Press, Oxford 2008, pp. 27-47; E. COSENTINO, *Il Mental time travel: una prospettiva evolutiva*, in: «Sistemi Intelligenti», vol. XXIII, n. 3, 2011, pp. 495-513.
[29] See D. BISCHOF-KÖHLER, *Zur Phylogenese menschlicher Motivation*, in: L.H. ECKENSBERGER, E.D. LANTERMANN (Hrsg.), *Emotion und Reflexivität*, Urban & Schwarzenberg, Wien 1985, pp. 3-47.
[30] See C.R. RABY, D.M. ALEXIS, A. DICKINSON, N.S. CLAYTON, *Planning for the Future by Western Scrub-jays*, in: «Nature», vol. CDXLV, n. 7130, 2007, pp. 919-921.
[31] See N.J. MULCAHY, J. CALL, *Apes Save Tools for Future Use*, in: «Science», vol. CCCXII, n. 5776, 2006, pp. 1038-1040.
[32] See T. SUDDENDORF, *Foresight and Evolution of the Human Mind*, in: «Science», vol. CCCXII, n. 5776, 2006, pp. 1006-1007.

[33] See A. SENGHAS, S. KITA, A. ÖZYÜREK, *Children Creating Core Proprieties of Language: Evidence from an Emerging Sign Language in Nicaragua*, in: «Science», vol. CCCV, n. 5691, 2004, pp. 1779-1782.
[34] See M. CORBALLIS, T. SUDDENDORF, *Memory, Time and Language*, in: C. PASTERNAK (ed.), *What Makes Us Human?*, Oneworld, Oxford 2007, pp. 17-36.
[35] See J.-L. DESSALLES, *Storing Events to Retell Them*, in: «Behavioral and Brain Sciences», vol. XXX, n. 3, 2007, pp. 321-322; J.-L. DESSALLES, *Why we Talk. The Evolutionary Origins of Language*, Oxford University Press, Oxford 2007.
[36] See R. DUNBAR, *Theory of Mind and the Evolution of Language*, in: J.R. HURFORD, M. STUDDERT-KENNEDY, C. KNIGHT (eds.), *Approaches to the Evolution of Language: Social and Cognitive Bases*, Cambridge University Press, Cambridge 1998, pp. 92-110.
[37] See D. TANNEN, *Conversational Style. Analyzing Talk Among Friends*, Ablex, Norwood (NJ) 1984, p. 99; S. EGGINS, D. SLADE, *Analysing Casual Conversation*, Cassel, London 2005.
[38] See G. LEONE, *La memoria autobiografica. Conoscenza di sé e appartenenze sociali*, Carocci, Roma 2001.