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The External Mind: an introduction

0. The aim of the Issue

This thematic issue of Versus is centred around an only apparently provocative question to be investigated with extreme attention and rigour (cf. § 3): what does it mean to claim that the mind is external? What does it mean to take cognition, thought and meaning into the body, into the world – into “the wild” to use a fortunate expression by Edwin Hutchins (1995)? This is the challenge that the present thematic issue of Versus is tackling: as it deals with cognition within a semiotic horizon in order to overcome the opposition internal/external concerning cognition. Tackling this question offers us the chance to reconsider the relations between semiotics and cognitive sciences and to build an initial and maybe unstable but much needed bridge between these polyphonic disciplinary fields. Cognitive sciences and semiotics have occasionally met without lasting results (cf. § 1). However, some recent turns in the concept of cognition – the situated and distributed epistemological turns that generally go under the name of 4E: embodied, embedded, extended and enacted – once again offer the chance of realising a fruitful comparison and articulation with a semiotic epistemology. We think it is high time for semioticians and cognitive scientists to cross each others’ paths and realise how much can be learned from the other.

This introduction i) highlights some of the articulations between semiotics and cognitive sciences in the last 20 years, ii) sketches a minimal history of the concept of cognition in cognitive sciences with the aim of highlighting the progressive approach to positions expressed by the semiotic epistemology endorsed by the editors of this volume, iii) zooms in on and articulates these increasing connections; iv) sums up a structural conception of cognition, trying to conjoin a functionalist perspective to cognition with the organism-based value-orientation of enactivism. In this way we aim at making the common framework of the contribution and the trajectories that they put in motion. Our hope is that this thematic issue will contribute to the many steps needed in order to foster a dialogue unhindered by the caricatural renditions of cognitive sciences perpetuated by a certain semiotics on the one hand and by the general unaware-
ness of the potentialities of the semiotic reflections for cognitive sciences on the other.2

1. Semiotics and Cognitive Sciences

Our arguments must begin with a caution. The relations between semiotics3 – both as an epistemology and as a field of issues and objects related to signs and meaning – and cognitive sciences are and have always been complex, heterogeneous and difficult to pinpoint and articulate. On the one hand, cognitive sciences have in their conceptual foundations widely relied on implicit semiotic notions like “representation”, “symbols”, “images”, “schemas”, etc.; moreover, the role, the use and the interpretation of language and other semiotic systems is a frequent domain of investigation. On the other hand, semiotics has often made a straw man of or even ignored the notion of cognition and the issue of cognitive mechanisms developed by cognitive sciences, preferring to concentrate on cultural artefacts and on texts in particular. We can, however, individuate a few authors that have actively taken into account the cognitive enterprise, and whose efforts can be distributed on a continuum between sympathetic

2 Many other steps have been taken already, especially due to the Northern European tradition in cognitive and dynamical semiotics. There are at the moment two research centres specifically dedicated to cognitive semiotics – one in Århus (Denmark) and one in Lund (Sweden) as well as a branched out centre in Cleveland (Ohio). The constructing and promoting of a cognitive semiotics can be testified by the journal Cognitive Semiotics (www.cognitivesemiotics.com) as well as by the two panels on Semiotics and Cognition at Iass 2009 in La Coruña, the Winter Symposium 2010 on Meaning and Interaction and the workshop on Experimental Semiotics both at the Center for Semiotics in Århus and the seminar on Semiotic Perspectives between Social Cognition and Practices held in collaboration with the Ehess in Paris.

However, it has to be noted that the situated and distributed perspective that is presented here has only recently begun being explored in the cognitive semiotics environment and not all the scholars involved in it have embraced the situated turns that we are going to focus on.

3 For a reader not particularly familiar with this discipline we can mention three different focus on which semiotics has constructed its specific positions: i) the attempt to tackle cognition through the different cultural semantic systems that shape it and not through a level of “internal” representations (primacy of semantics and dependence of meaning on interpretive habits and social practices); ii) the attempt to understand meaning as an effect of the different forms of expressions that vehiculate it (primacy of semiotics, that is, of the relation between content and expression); iii) the attempt to construct rigorous techniques for semantic (i) and semiotic (ii) analyses that are able to construct heuristic models of analysis that are valid independently from the medium and the disciplinary domain in which these systems are realized (primacy of the form on the substance). On this ground, semiotics has worked on a wide variety of objects: texts, practices, discourses, tasting experiences, literature, visual arts, dance, cultural artifacts, computer games, etc. The epistemological framework of this semiotic approach relies on Peirce’s pragmatism on the one hand and structural linguistics on the other hand. On the relation between these two paradigms cfr. Eco (1997: 217-8) and Paolucci (2010).
The external mind: an introduction

Attentions (Violi 1997), philosophical and epistemological dialogue (Eco 1997) and radical critique of the very foundations of the cognitive enterprise (Rastier 2001).

We will tackle the evolution of the notion of cognition in cognitive sciences more in detail in the second part of this introduction; however, here we can anticipate the core of the possible articulation and of the difference between a semiotic epistemology and a traditional cognitivism. Both these perspectives share a common concern: the origins and articulation of knowledge and thought. However, their foci and assumptions seem to lead to an almost irreparable incompatibility: while semiotics assumes the primacy of language and culture in determining the ways and the content of thought, cognitivism assumes the primacy of internal universal mechanisms.

Indeed, the cognitive revolution postulated – at least methodologically (cf. § 2) – that semiotic phenomena and language in particular are merely expressions of largely innate internal mechanisms, the socio-cultural dimensions being nothing else than superficial variations. The first generation of cognitivists, led by Noam Chomsky, postulated the existence of a language module sensitive – during a crucial phase in the development of the child – to minimal external linguistic stimuli and therefore able to select the relevant structures of the language surrounding the child. As a reaction to such an approach and to its excessive focus on semantics the second generation of cognitivists interested in linguistics led by George Lakoff, Ronald Langacker and Leonard Talmy aimed at individuating perceptual and categorial constants structuring and enabling language use and comprehension (cf. Fusaroli, infra). In any case the epistemology of structural linguistics – from which semiotics was born – assumes a position radically opposed to both: thought and cognition are but an "amorphous mass" before the appearance of language that gives them form and structure.

Psychologically, setting aside its expression in words, our thought is simply a vague, shapeless mass. Philosophers and linguists have always agreed that were it not for signs, we should be incapable of differentiating any two ideas in a clear and constant way. In itself thought is like a swirling cloud, where no shape is intrinsically determinate. No ideas are established in advance, and nothing is distinct before the introduction of linguistic structure. (Saussure 1974:110, par. 155)

A cognitivist position that reduces linguistic and semantic dimensions to other cognitive levels is clearly incompatible with such statements (cf. Violi 1997: 44-56; Gaeta & Luraghi 2003). This incompatibility is at the basis of Rastier’s (1991) harsh critiques of the cognitivist positions. Following up on Bréal (1897), Saussure (1916) and Hjelmslev (1959),

4 This has not to be interpreted – as sometimes has happened – as a radical Sapir-Whorf like hypothesis, but as an acknowledgment of the role of language at different levels in shaping the specificity of human cognition (Cf. Note 3).
Rastier argues that a theory of language that wants to be able to construct concrete and heuristic analytical models needs to start from real linguistic data: texts and the many ways in which meaning is constructed in these texts. According to Rastier, semantics should thus be analysed as an autonomous level where meaning is organised by local differences and culturally defined interpretive practices. Through language, texts and socio-cultural practices we learn – in important ways – how to think and what to think. Indeed, structuralism in following Saussure assumes that thought is “an amorphous mass” before it gets semio-linguistically segmented. Consequently it is this very same semio-linguistic segmentation that gives thought a structure. Therefore, to study this semio-linguistic structuration, means to study the structure that gives thought and cognition a shape. To strengthen this point we can refer to Gardner’s (1974) work on structuralism. In this book Lévi-Strauss is considered a cognitive scientist that, through the study of social and meaning structure, cast a light on the very same structures of the human mind. Lévi-Strauss himself made this connection explicit in his book *The Savage Mind* (1968). However, it has to be acknowledged that this relation between semiotic structures and cognition has not been explicitly further thematised and made object of further research in the structuralist tradition (as opposed to the Peircean tradition cf. *infra*, § 3, 4).

To sum this discussion up we can state that, on the one hand, semiotics wanted to explain cognition through semio-linguistic structures that were defined by the linguist Louis Hjelmslev as an “autonomous entity of internal dependencies” (Hjelmslev 1957:100). On the other hand, cognitive sciences, when dealing with language, insisted on its radical dependence on an internal conceptual level.

One of the important points of structuralist semantics is the clear-cut distinction drawn between the semantic linguistic level and the conceptual level. In this respect, structural semantics reversed a tendency, which had dominated the study of language for centuries, to psychologise the relationship between thought and language, with the latter being determined on the basis of the former. [...] Cognitive semantics adopts a radically divergent position on this point: linguistic meanings cannot be isolated and separated from their conceptual counterparts. (Violi 1997: 31)

Language and socio-cultural practices are crucial in defining our world and of the way we think. Therefore semiotic tradition could not accept the cognitivist principle that mental representations can be analysed at a wholly separate level not only from the biological one but also from the socio-cultural level (cf. 2.1). Since thought and representation are nothing but an amorphous mass before the appearance of socio-cultural semio-linguistic structures, the very idea of an autonomous and internal level of mental representation was rejected. This is the reason for which the semiotic tradition has never been very interested in no-
tions like “mental spaces”, “internal representations” or “image schemas”. In semiotic eyes, these notions were taking semio-linguistically motivated structures and postulating them as purely internal conceptual or mental structures thus contradicting the foundational move of a semiotic epistemology: to explain thought and cognition through the study of semio-linguistic systems.

However, it must be clear by now that even if the differences between semiotics and cognitive sciences seem radical, the two disciplinary fields share a common founding issue: to explain cognition and the relation between thought and language. Semiotics tried to do so by developing tools and procedures for textual and semantic analyses. Cognitive sciences tried to do so by interdisciplinarily investigating the mechanisms that make cognition and thus also language use and interpretation possible. However, the fact that cognition had something to do with language and that language had something to do with cognition was an explicit and shared belief.

Following up on this common interest, the semiotic authors that were the most interested in a cognitive semiotics and in a semiotic and philosophic theory of knowledge like Umberto Eco (1997) and Patrizia Violi (1997) constantly engaged their conceptual enterprises with the reflections and the results developed in cognitive sciences and more in particular in cognitive linguistics.

This engagement was an obliged move: semiotics was starting to deal systematically with the sensory domains and with perception, arguing that there is semiosis even in perception and that meaning, inference and interpretive mediation informs cognition from the very first sensory impressions. Already cognitive linguistics had triggered the embodied revolution of cognitive sciences (Gibbs 2006; § 2). Models of abstract cognition and language were increasingly focused on the complex articulation between meaning, perception, categorisation and sensory and bodily dimensions. The different positions developed through this approach were heterogeneous and subtly nuanced, but they all agreed that the processes of semio-linguistic construal where grounded on the same cognitive processes involved in the processing of encyclopaedic knowledge and in perception.

This dialogue proceeds in two slightly different directions. In Meaning and Experience, Violi (1997: 32-6) relies widely on the cognitive linguistic insight that linguistic lexical meaning involves perceptual and categorial cognitive mechanisms (cf. Violi 1997: 63-75) in order to move several critiques to a purely structural approach that instead defines meaning in terms of pure lexical and semantic differences. Violi thus argues for the need to build an integrated theory of the structuralist focus on differences and textual dimensions and an attention to the workings of the cognitive

Such a belief was anticipated by Charles Sanders Peirce who defined semiotics as the discipline that studies cognition, therefore making it a sort of “cognitive science” (cf. § 3).
system and to the recurring structure of our sensory and bodily experience. The findings and assumptions of cognitive linguistics where thus critically considered and integrated in a semiotic approach.

*Kant and the Platypus* by Eco (1997) tackles the issue in a different way. The focus is the articulation between perception and encyclopaedic categorisation both in perceptual recognition and in the construction *ex novo* of the concept for a yet unknown object of which the morphological saliences are perceived and sensorially categorised (cf. Eco 1997: chap. 2). The epistemological move is to recover the philosophical and semiotic roots of the problem. Cognitive linguistics founds the relation between categorial conceptual entities and perceptual sensory entities on key notions like image-schema (cf. § 2.2) acknowledging – if not much else – the Kantian ascendance of this concept (Johnson 1987). Eco takes this ascendance seriously, carefully considering the schematism of empirical concepts and its reformulation in Peirce’s cognitive semiotics, – a legacy inspiring many passages of this thematic issue – and carefully constructing a taxonomy of categories and conceptual types more nuanced and attentive to the discursive dimensions of many concepts.

While Eco’s approach is more critical, Violi shares one of the crucial nodes of cognitive linguistics, which is that cognition and therefore language are grounded on human experience and that human experience is primarily shaped by the body and by the senses (cf. § 2.1.3).

Why did these important exchanges and dialogues not manage to start bridging the gap between semiotics and cognitive sciences, then? It seems to us that one of the main obstacles to this operation was an increasing attempt inside cognitive sciences to naturalise meaning, phenomenology and experience. Indeed, the very idea of “naturalising meaning” sounded deeply alien to semiotics and seemed like an attempt to reduce any cultural and linguistic level to an underlying biological or even physical domain, where it would lose any semiotic autonomy. However, the “naturalisation” approach was very far from this idea, being a mere methodological and regulative approach and not a reductionist one as it was thought to be inside semiotics. Works like *Naturalizing Phenomenology* (Petitot, Varela, Pachoud and Roy 1999) programmatically explored traditional humanistic domains like linguistic meaning, aesthetic experience, etc. through the tools and the models of natural sciences, in particular through mathematical models and neuroscientific experiments and simulations. The very idea of “naturalisation” simply entailed the systematic attempt to use tools of analysis imported from natural sciences. An approach is particularly effective in formalising mathematically and neurally grounding phenomena of perceptual experience like amodality, bistability, morphological emergence, image schemas, etc., phenomena that had been described by Gestaltists and cognitive linguists (cf. Sarti, Citti and Petitot 2008).

Anyway, in semiotics – a discipline that Eco described as “the logic of culture” (Eco 1975) – the very idea of naturalisation of meaning and
the phenomenological aspects of experience seemed alien, if not contradictory both for epistemological reasons and because of the established practice of focusing on the qualitative analysis of texts and discourses. This generated a straw man: many of the cognitive researches and notions were caricatured as part of a reductive project of “naturalisation” that was missing the very point of what it was trying to explain. Therefore, any potential interest in constructing a dialogue with such a project was lost and the labels “cognitive” and “cognitivist” ended up referring to something that was at the antipodes of semiotics and dead wrong in being so.

However, the cognitive enterprise is richer and more nuanced than that and a dialogue with it could enrich both interlocutors, especially now that the “situated turns” are explicitly taking into account those dimensions – language and artefacts, discourses and social normativities, etc. – that semiotics has traditionally been advocating for itself. It is thus time for semiotics to enter the debate both to contribute to it and to learn from it. In order to lay the ground for this dialogue and to highlight how this new opportunity came to be we will now briefly reconstruct the history of the notion of cognition in cognitive sciences from classical cognitivism to the epistemological changes of perspective that we can refer to as “the situated turns” in Cognitive Sciences.

2. An Introduction to the Situated Turns inside Cognitive Sciences

Cognitive sciences have seen a progressive evolution of the concept of cognition from algorithmic software-like logical conceptions to a progressive entrenchment in body, environment and culture. The concept of mind seems to be stretched and redefined, since cognition is increasingly articulated with notions like consciousness, phenomenology and meaning, thus opening for a more semiotic approach. However, these situated and phenomenological turns goes under a wide variety of names and implies a wide variety of perspectives whose differences are often underestimated. Situated Action, Cultural Historical Activity Theory, Enactivism, Shared Mind, Taxonomic Externalism, Active Externalism, Locational Externalism, Environmentalism, Vehicles Externalism, Situated Robotics, Animated Vision, Wide Computationalism, Sensorimotor Account of Perception, Augmented Cognition, Distributed Cognition, Cognitive Integration, Extended Functionalism, Extended Mind and Extended Life are only some of the approaches that have been pushed forward.

*Normativity should not be interpreted as a rigid and determining rule, but the influence exerted by a standard or pattern, esp. of social behavior, that is typical or expected of a group (cf. Fusaroli infra). In this sense it is close to Hutchins’ (2001) notion of “cultural model”.*
Since we cannot satisfactorily articulate all these approaches within the limits of this introduction we will proceed by producing a sketch of the situated turns as articulated in three moves: the inclusion of i) body, ii) immediate context, and iii) socio-cultural and symbolic dimensions into cognition. Through this excursus we will highlight the role that these turns could play within a semiotic horizon, in that this calls for a more active role for phenomenological investigations and for the awareness of a constitutive mediateness of cognitive processes. Thus cognition is distributed via cultural practices and emerges as a mediated process between a plurality of instances that cross and redefine the biological barriers of the individual, and mind becomes the active field of manifestation of the evolving signs of these distributed processes.

2.1 The birth of Cognitivism

Modern cognitive sciences were born in the late 40’s – and received this name in the 70’s – as a reaction to behaviourism, an approach that tried to analyse action, thought and perception in terms of behaviours, that is, in terms of publicly observable processes without recourse either to internal physiological events or to hypothetical constructs such as the mind. In other words, behaviourism was the scientific study of organisms – and human beings – in terms of relations between the input of stimuli and the output of physical behaviours. Inner mental states were considered an unnecessary element in the theory – independently from their actual existence – since no knowable difference could be argued between two states of mind unless there was a demonstrable difference in the behaviour associated to each state.

Behaviourism was the dominant paradigm in the scientific study of human psychology until two conferences took place: “Cerebral Mechanisms in behaviour” hosted in September 1948 at CalTech and “Symposium on Information Theory” hosted in September 1956 at MIT. These conferences were crucial in getting together some of the people who had been trying to articulate scientific alternatives to behaviourism like von Neumann, McCullough, Lashley, Newell, Simon, Chomsky, Miller, Bruner, Goodnow and Austin. The basic idea that was pushed forward is that rather than being imposed from without the organisation of behaviour emanates from within and this internal organisation, cognition, is what we should be studying. Howard Gardner in his still insightful reconstruction of the origins of the discipline describes the new paradigm in the following way: “Cognitive Science is a contemporary em-

7 An interesting alternative to behaviourism was Gestalt Theory. However, its German initial momentum got disrupted by the ascent of the Third Reich and the Gestaltist refugees in the States did not find fertile ground for their perspective, especially considering they were not allowed to have PhD students (Ash 1999). Some of the Gestaltist insights however will pass into ecological psychology through the connection between Koffka and Gibson (Niveleau 2006).
pirically based effort to answer long-standing epistemological questions – particularly those concerned with the nature of knowledge, its components, its sources, its development and its deployment” (Gardner 1987:6). Following Gardner’s well-researched investigations and interviews with the pioneers of the field, five shared methodological beliefs can be seen as defining the cognitive enterprise:

1. Mental representations have to be analysed at a wholly separate level from the biological or neurological, on the one hand, and the sociological or cultural on the other.
2. The computer is central to any understanding of the human mind, both as a tool for data analysis and simulation and as a model for cognition.
3. There is a need to deliberately de-emphasise certain factors, which may be important for cognitive functioning but whose inclusion at this point would unnecessarily complicate the cognitive-scientific enterprise. These factors include the influence of affective factors or emotions, the contribution of historical and cultural factors and the role of the background context in which particular actions or thoughts occur.
4. Much is to be gained from interdisciplinary studies.
5. A key ingredient in contemporary cognitive science is the agenda of issues and the set of concerns which have long exercised epistemologists in the Western philosophical tradition.

The revolutionary object of cognitive science is thus cognition: a level of “mental representation”, of internal mediation between input and output, perception and action which was largely ignored by behaviourism. In the effective words of Susan Hurley (1998) cognition as storage and manipulation of representation is the filling of a sandwich, to which cognitivists are finally getting, and that behaviourists completely missed focusing on the less interesting bread slices. Mental representation has to be analysed at a level wholly separate from a biological or neurological level on the one hand and a sociological or cultural level, on the other. The idea – inspired and supported by the incredible success of computer science and artificial intelligence – is that cognition follows the principles laid by Frege – reasoning strictly follows the form of propositions and their content does not matter – and Turing – this form is symbolic and manipulated according to rules. Concepts – the bricks of mental representation – are often represented as lists of features (cf. the classical view in Smith and Medin 1981) organised and

\[ It\ has\ to\ be\ noted,\ however,\ how\ Gardner\ himself\ underlines\ both\ the\ philosophical\ situatedness\ of\ the\ research\ in\ cognitive\ science\ and\ the\ temporary\ nature\ of\ the\ exclusion\ of\ issues\ like\ context,\ history\ and\ culture\ from\ cognition.\]
symbolically manipulated in terms of predicates that stand for features of the external world. In Jerry Fodor’s words: “What I am selling is the Representational Theory of Mind. [...] At the heart of the theory is the postulation of a language of thought: an infinite set of “mental representations” which function both as the immediate objects of propositional attitudes and as the domains of mental processes” (Fodor 1987: 16-17). To think means to manipulate symbols in a particular manner regardless of the domain. The formal manner of manipulating symbols constitutes the syntax of the domain, syntax that is thus not only a unique formal property of linguistic computation but a more general property of all cognitive domains from vision to motor to problem solving ones. Cognition is conceived as a language-like inner layer that mediates between action and perception thus enabling human beings to not simply react to the world but to represent it, to manipulate these representations and as a consequence to come up with more complex patterns of behaviours that better serve their aims and desires.

2.2. Computationalism and Neural Networks

An important attempt at going beyond such a computational approach was through the re-discovery of neural networks as models of the mind/brain complex (cf. Clark 2001). Initially developed by Warren McCulloch and Walter Pitts (1943), neural networks were brought back to the mainstream scene by David Rumelhart, David McClelland and the PDP Research Group (1986). While classical computationalists explain cognition by reference to language-like structures, connectionists explain cognition in terms of neural networks, that is, networks of simple processing units, in other words a strong simplification of the networks of neurons found in the brain. None of these simple processing units need to represent anything. Nevertheless connectionist models are able to behave in ways that mimic the behaviour of human beings even in the linguistic – and most prototypically symbolic – domain (cf. Elman 1995, Zlatev 1997). This model criticises the conception of formal representations while not – at least in its beginning – moving beyond the focus on internal structures of mediation between perception and action. Symbolic representations and the direct programming of algorithmic rules are replaced by connections between sub-symbolic nodes and learning processes. Symbols are not outright rejected, however, their role changes: from being the constituents of cognition they become a byproduct of constraint satisfaction processes, that is, of statistical pattern recognition, completion and disambiguation9.

2.3. The crisis of Internalism

The internalistic conception of cognition would quite soon reach a crisis. The attempt at studying human and animal behaviours and cognitive performances and at simulating them via algorithmic software and robots runs into serious issues. Simple everyday tasks like riding a bike require complex loops of anticipations and feedbacks that are hard to implement in a sandwich like system. Animal behaviours relying on relatively simple neurobiological structures reveal themselves to be impossible to reproduce in robots and computer simulations of comparable or even superior complexity. Beer and Chiel (1993) demonstrate this with their analysis and simulation of cockroach behaviours. While much research retracts to safer and more intellectual domains like chess strategies a growing number of researchers start acknowledging that – extending on Hurley’s metaphor – the filling intermingles with the bread, no clearcut boundary between cognition, action and perception is possible anymore if we want to understand what is really going on. Clark dubs this alternative vision ‘Escher spaghetti’: “a seething mass comprising not just multiple criss-crossing strands (ordinary spaghetti), but strands whose ends feed back into their own (and others) beginnings, making ‘input’ and ‘output’, and ‘early’ and ‘late’ into imprecise and misleading visions of complex recurrent and re-entrant dynamics” (Clark 2009).

2.3.1. Embodied Cognition

The first step is thus to bring the body into the picture. Cognition happens through the body and not just at an algorithmic or internalistic level. Embodiment becomes a key term in several strands of cognitive research that tries to overcome the “sandwich” conception of cognition, a term so effective that by the 1990s several authors had declared embodied cognitive science to be a new paradigm in cognitive science (cf. Varela, Thompson and Rosch 1991; Clark 1997; Pfeifer and Scheier 1999). The way the body is brought into the picture, however, is far from uncontroversial. Several scholars (Nunez 1999, Clark 1999, Wilson 2002, Gibbs 2006, Gallagher 2007, Rohrer 2007, Violi 2007, etc.) have attempted to discriminate between the different uses of “embodied”. Relying on their work and developing it we can distinguish at least four basic uses.

The first – and most trivial – way of talking about embodied cognition is to claim that any cognitive process has an instantiation through a material support (as in Churchland 1991). A particularly salient case is embodiment as biological materiality of the cognitive processes: cognitive processes happen through the nervous system and the brain and an understanding of the specificity of these neurobiological structures is necessary for understanding cognitive processes.

A second and more interesting way of talking about embodied cognition is to consider more basic bodily functions like perception and motor control as primary shaping forces in the neural system both at a phy-
logenetic and at an ontogenetic level. Sensorimotor neural mechanisms and pathways thus act as a basis for the implementation of high level cognition as well. Lakoff and Johnson’s embodied realism and conceptual metaphors (1999) and Barsalou’s perceptual symbols (1999, 2009), for instance, largely rely on such a conception. This shaping influence of the sensorimotor domain is perhaps the theoretical construction in cognitive sciences that has influenced the debate in semiotics the most. We have already quoted Eco’s and Violi’s elaborations on it. We can now add that it is this embodied dimension of cognition that had a central role in the development of the Northern European Cognitive Semiotics at a philosophical (Østergaard 2006, Stjernfelt 2007, Zlatev 2010), computational (Zlatev 1997), experimental (Wallentin et al. 2005), aesthetic and linguistic (Bundgaard et al. 2003, Bundgaard 2004) level.

Beside its role in the ontogenesis of cognitive abilities and a condition for its taking place, the body can also play an active role in the unfolding of online cognition, thus leading to a third conception of embodiment. Thelen and Smith (1994) brilliantly demonstrated the crucial role that the size, elasticity and weight of muscles and bones play in learning how to walk and in walking. To mention an example easier to reproduce we often use our fingers to count and remember the number of occurrences of an event, offloading the burden of working memory. If already in the second conception of embodiment the vehicles of cognition – sensorimotor circuits supporting and structuring abstract cognition – crossed sides and shaped the contents of cognition – abstract cognition involves structures from basic sensorimotor experience – the fourth conception of embodiment makes of this crossing its explicit theme.

The fourth and probably most complex conception consists indeed in taking into account the role of the phenomenal experience of the lived body that can be found for instance in Gallagher’s (2005) distinction between body schema and body image. Body schemas are unconscious body awareness including the almost automatic system of processes that constantly regulates posture and movement to serve intentional action and our pre-reflective and non-objectifying body-awareness. Body images are instead conscious representations of some sensorimotor aspect of the body or, in phenomenological terms, a system of experiences, attitudes and beliefs where the object of such intentional states is one’s own body). Experiencing and cognising through a body often constitutes and shapes the contents of the cognition and experience itself. This tradition which is strongly inspired by European phenomenology, Husserl and Merleau-Ponty in particular, has recently seen a revival and is inspiring both a conceptual and an experimental re-assessment of many cognitive tenets, to the point that recently the idea of a “phenomenological mind” has been introduced in the landscape of cognitive sciences (cf. Zahavi & Gallagher 2007 and the journal “Phenomenology and Cognitive Science”).
2.3.2. Embedded Cognition

The second step beyond internalism is to realize that the body is not a static body, but a body in action, widely interacting with and integrating the (immediate) environment. This context-embedded view of cognition focuses on the way we actively use the environment to solve the problems we face: “Our problem-solving performances take shape according to some cost function or functions that, in the typical course of events, accord no special status or privilege to specific types of operations (motoric, perceptual, introspective) or modes of encoding (in the head or in the world).” (Clark 2008: 21-22). There is no inherent reason for the biological control system to care about differences of location or type of resource instead of simply using whatever it can to get the job done, following one or another of the most convenient cost-benefit trade-offs available. The infant body in Thelen’s and Smith’s analysis takes advantage of the different density of the water and relying on it develops an earlier ability to walk that does not happen outside of the water. If this use of the (physical) context can be seen to a higher degree as a condition for (motor) cognition, it can be easily shown how the environment can have important consequences in higher order cognition. Constantly using a notebook to overcome memory deficits due to Alzheimer (Clark & Chalmers 1998), or, less drastically, using an abacus to count the times we have written “cognition” in this introduction or using a counter to keep track of the score of a basketball match are instances of a use of the environment that is analogous to the use of our fingers mentioned in the previous paragraph, a use that extends and integrates our biological cognitive skills.

2.3.3. Distributed Cognition

The third step beyond internalism consists in the inclusion of the role of language and socio-cultural normativities as well as of other cognitive agencies. Including language and socio-cultural normativities in cognitive processes does not mean to assume or predict a complete internal representation of them but the possibility to engage with them within the horizon of a community and the ability of doing so. Ruth Millikan explains this with an analogy: “I no more carry my complete cognitive systems around with me as I walk from place to place than I carry the U.S. currency system about with me when I walk with a dime in my pocket” (Millikan 1993: 170 cf. also Hutchins 1995; Latour 2005; Wilson & Clark 2009). We do not need to carry the U.S. currency system as long as we know how to use a dime and there is a system ready to accept it and to enforce the currency system. One of the first and best examples of this is still Hutchins’ (1995) in depth analysis of the coordination of navigation on US navy ships around San Diego. His work showed how the whole process in its planning as well as in its unfolding is not present in its entirety in any of the minds of the single individuals; on the contrary, it emerges through the
coordination and partial overlapping of knowledge and actions enacted across different individuals with different roles, competences and hierarchical positions, artefacts, and tools in the environment. Another example is that of a constructive dialogue that, employing social linguistic competences unfolded in the specific context, engages knowledge and ideas from different individuals, giving rise to new decisions and information.

Cognition, initially conceived as localised – in the brain, in the nervous system, in the body, etc. – is now to be distributed and situated in a bundle of cultural practices and social horizons and emerges as a mediated process between a plurality of instances that cross and redefine the biological barriers of the individual.¹⁰

It is especially this last step beyond internalism that leads to a convergence with an authentically semiotic epistemology. A turn that is effectively summed up by Hutchins:

The distributed cognition perspective aspires to rebuild cognitive science from the outside in, beginning with the social and material setting of cognitive activity, so that culture, context and history can be linked with the core concepts of cognition. (Hutchins 2001: 2072)

This coupling between cognition, history and context through an activity characterises the nature of the distributed approach and draws semiotics and cognitive sciences together. The shift is one from a focus on “things”, such as representations, to a concern with “activities”, such as the act of representing. Such activities are often bodily and they are often world-involving in their nature.

Before drawing any conclusion from this excursus in some of the evolutions of the notion of cognition let us briefly expand a bit on the Peircean framework and its parallels to and divergences with cognitive sciences.

3. The Peircean approach to (distributed) cognition

In a similar but even more radical move, Peirce’s theory of cognition, grounded on semiotics and on pragmatism, had as an objective to create a science of cognition “from the outside”. Beginning from the “social and material setting of cognitive activity” it considers culture, context and history constitutive of the very idea of cognition. Let us briefly reconstruct it. Peirce’s theory of cognition is anti-intuitionist and anti-introspectionist, which means that: i) it rejects the possibility of an unmediated access to internal states (introspection); ii) it rejects the possibility of constructing

¹⁰ It has to be made explicit that this turn is quite controversial and there are hardly two authors sharing exactly the same conception of the mechanisms and of the consequences of this distribution.
a cognition directly from external objects (intuition) without the mediation of previous knowledges concerning the same objects. Therefore we need a semiotics, that is, a discipline that investigates how external objects and internal states are reconstructed by tentatively engaging the world through the mediation of previous knowledge and skills. According to Peirce, any cognition that “is present to the mind” is indeed determined by previous cognitions that are extracted from thoughts in signs (CP 5.213). Peirce’s semiotics follows from two assumptions: 1) all cognitions are signs; ii) we have no power of thinking without signs. In this framework, *semiotics is the science of cognition* and signs are any element that stands for something else in some respect (CP 5.283).

The act of cognising – the construction/interpretation of a sign – can interpret its object – a previous mental state, an external event, etc – under a certain respect or capacity through the mediation of previous cognitions, that is, through dispositions of the cognitive systems to act and interpret in certain ways. In other words the cognition is always the most often tentative and partial construction of a particular point of view through which it stands for its object and tells us something more about it under a certain respect. Peirce calls *interpretants* these previous cognitions that determine “the cognition which is present to the mind”. Interpretants are not entities located in the individual’s mind, they are entities intervening in the phenomenological structuring of cognition itself that are engaged and supported by the community (CP 5.311).

Semiotics is thus a theory of cognition in which on the one hand we deny having a direct access to the internal theatre of representation and the ability to cognise objects and events without any mediation, but on the other hand we focus on the active and conceivable cognitive engagement that relies both on the subject and on the environment in its physical, social and cultural aspects.

This Peircean framework attempts to bridge the gap between physical, mental and socio-cultural and – if adequately developed – offers a tentative way out of the opposition that we have seen semiotics and cognitivism engage in (cf.§ 1): semiotics attempts to explain thought and cognition through the semio-linguistic, while cognitive sciences attempt to explain the semio-linguistic through thought and cognition. Let us try to sketch this possible solution.

### 4. Semiotic cognition

If classical cognitivism saw cognition as characterised by the storage and manipulation of formal symbols inside the head, we have seen the evolution of a quite heterogeneous landscape through the development of neural networks, embodiment, embedded and distributed approaches. However, something seemed to stay constant: the idea that the human
approach to the world is always mediated in a complex and heterogeneously articulated way. Cognition is the act of mediating and constituting reactions to the world, through cognition the organism avoids being un-mediately determined by its immediate context. We have seen that according to Peirce and to distributed cognition, representation is not necessarily autonomous or internal. Cognition is constituted by inferences and inferences widely rely on external elements like the act of writing (CP 7.364-6), the use of scientific instruments (W6: 69-70), the drawing and manipulation of diagrams (NEM IV: 316–19) and the enaction of socio-cultural normativity (W3: 276–90) and of intersubjectivity (CP 4.431). But what is it that this extended semiotic cognition tells us about its object? “Consider what effects that might conceivably have practical bearngs you conceive the objects of your conception to have. Then, your conception of those effects is the whole of your conception of the object.” (CP 5.2). What Peirce is stating here is that what we think – the cognition, the sign – is to be understood in terms of what it makes us ready to do consciously or unconsciously. In other words, meaning resides in the pragmatic efficacy which the object of our conception acquires during a certain process thanks to a disposition to respond, shared on a collective level and crucial in the production of sense. Therefore cognition in all its distributed components is a way to:

- perceive the regularities and affordances (possibilities for further action and cognition) of the physical and socio-cultural environment, possibilities that are due to the systems and the activities in which the individual cognitive system is, was and could conceivably be;
- manipulate regularities and affordances, either by mental simulation or by actual engagement with the environment
- represent and memorise regularities and affordances as modified dispositions to act, react and cognise but also as internal and external symbols

The development of semiotic systems, language in particular, catalyses the flexibilities and the possibilities of the cognitive system at different time scales from the phylogenetic, via the ontogenetic to online processes (Deacon 1998, Donald 2001, Thibault 2004, Tylén et al. 2010, Fusaroli, infra) and in a more explicit way opens the social arena of cognition where inheritance of socio-cultural and temporally sedimented constraints and negotiation, clashes and alignment play a crucial role.

Endorsing this vision of cognition, what is the role of mind? If the mind is the field where phenomena (thoughts, sensations, beliefs, emotions, etc.) manifest themselves to the “subject”, the process through which this happens is radically distributed. Several examples of this are provided in the contributions to this issue (§ 7) : the role of the body (Cappuccio & Wheeler, infra; Fusaroli, infra; Goodwin, infra; Granelli,
infra; Kirsh, infra), the role of the external environment, including artifacts (Goodwin, infra; Granelli, infra; Paolucci, infra; Rosero, Lecusay & Cole, infra), the role of socio-cultural normativities (Cappuccio & Wheeler, infra; Fusaroli, infra; Gallagher, infra; Goodwin, infra; Rosero, Lecusay & Cole, infra), the role of other agencies (Gallagher, infra; Goodwin, infra; Rosero, Lecusay & Cole, infra). The body in action, the external environment, other subjects, material artifacts, socio-cultural normativities, all contribute crucially to constitute the thoughts we have, the sensations we experience, the beliefs we share.

This is what we define as the “external mind”: a conception of the mind as constituted through distributed processes and therefore a possible way out of some of the traditional oppositions in philosophy of mind and generally in the Western tradition: oppositions such as body/mind; internal/external; subject/object; self/other. If the mind is grounded on a distributed cognitive system in which bodies, environment, normativities and so on are actively engaged and co-constitute its processes, an adequate cognitive theory cannot be built on those oppositions.

6. Concluding remarks and future openings

It is thus time to draw some conclusions before introducing more in detail the contributions to this issue. Given the contemporary landscape of approaches to cognitive processes “out of our heads” (Noë 2009), how does our semiotic perspective position itself?

We believe that a semiotic epistemology leads the way for the development and articulation of what we can call a structural conception of cognition that allows to: i) reformulate and radically rethink the standard notion of “representation” and ii) keep together the more functionalist theories of cognition with the more enactivist ones. Let’s try to explicate these points.

Rejecting an a priori distinction between internal and external does not mean rejecting the importance of the organism or of the brain, it means to re-integrate them within the material, socio-cultural and semiotic horizons and to show their co-constitution with these dimensions. In the words of an anthropologist that built all his research on the attempts at integrating the heterogeneity of the components of cognition:

so far as man is concerned, one of the most striking characteristics of his central nervous system is the relative incompleteness with which, acting within the confines of autogenous parameters alone, it is able to specify behaviour. [...] From this standpoint, the accepted view that mental functioning is essentially an intracerebral process, which can only be secondarily assisted or amplified by the various artificial devices which that process has enabled man to invent, appears to be quite wrong. On the contrary, a fully specified, adaptively sufficient definition of regnant neural processes in terms of intrinsic parameters being impossible, the
human brain is thoroughly dependent upon cultural resources for its very operation; and those resources are, consequently, not adjuncts to, but constituents of, mental activity. (Geertz 2000:75-76)

This is a crucial challenge for cognitive sciences and semiotics, a challenge to which we hope the contributions to this issue constitute the beginning of an answer, an answer that is not without consequences in the contemporary theoretical landscape. The approaches that push the notion of cognition “out of our heads” and away from traditional symbolic logic are not homogeneous or even compatible with each other (cf. Robbins & Aydede 2009, Clark & Kiverstein 2009, Di Paolo 2009). A more thorough comparison between them and with the semiotic epistemology we have sketched here both in conceptual and in applicative terms is still due. However, a few more words can be used here to define the way that a semiotic and pragmatist epistemology seems to lead us to, in particular regarding the crucial discussion on representation and its role in cognition. Is cognition defined in important ways by representation as Hutchins (1995), Cappuccio & Wheeler (infra) and at least partially Gallagher (infra) and Clark (1997, 2008) claim or is representation to be dismissed and cognition to be rooted in the non-representational capacity of autonomous systems to self-regulate their own situation in an environment, in accordance with its capacity for sense-making, as in Varela et al (2001), Thompson (2007), Di Paolo (2005), Kirsh (infra)? While many of the contributions to this issue are still exploring the existing theoretical landscape, it seems to us that a semiotic epistemology can pursue a convergence between such perspectives further, or at least investigate further the construction of a third perspective that can conjoin important insights from the first two. Such a perspective would involve i) a reformulation of the notion of representation, detaching it from an internalist and autonomist perspective typical of classical cognitivism (§ 2.1) as well as from the idea of representation as a “mirror of the world”; ii) the development and articulation of a pragmatist theory of the meaning of representation, that connects cognition to its conceivable practical effects, effects that are constituted through an integration in the cognitive process of organism, environment, other agencies and socio-cultural normativities.

Let us articulate these points more in detail: in a semiotic perspective inspired by Peirce all representations are representamen, that is, signs: triadic functions that do not simply reflect the state of affairs in the world, but that are the construction of a particular point of view through which the sign stands for its object and tells us something more about it under a certain respect (CP 8.332). As articulated in § 3, a representamen (sign) can cast a light on its object under a certain respect exclusively through a mediation in an interpretive process. In other words, representations are operative approaches to world, the reconstruction of conceivable possibilities for action, perception and interpretation that can in turn further
modify the landscape of possibilities. These possibilities are constituted through the interaction and the integration of biological constraints and processes, environmental structures and constraints, socio-cultural normativities and other agencies. Gallagher (infra) shows the importance of the legal system to constitute and solve certain cognitive tasks. Fusaroli (infra) emphasises the pervasive role of language at different time scales in restructuring our possibilities for learning and coordinating. Kirsh (infra) detailedly articulates the role of the body of dancers in the structuring of their perception and construction of coordinated activities. Since all these dimensions co-constitute the conceivable consequences and the structure of our cognitive activity it is hard to see how representations in the semiotic sense (*representamen*) could be autonomous from the biological and neurological level on the one hand and the sociological and cultural one the other. Following the anti-introspectionism and anti-intuitionism of a semiotic and pragmatist conception of cognition, the notion of representation is explicitly constituted by the interplay of and by the possibility of relying on and/or anticipating the role of constraints of biology, physical environment, intersubjectivity and the external encyclopaedic knowledge and practices of the community and it unfolds through such interplay. Saying that all representations are *representamen* means focusing our gaze on their mediated nature and on the heterogeneity of the elements engaged in such mediation thus prompting the researcher to untangle the complexity of such mediation without reducing it. While the traditional notion of representation as explicit symbol manipulation was effectively criticised by connectionists, dynamical system theorists and enactivists, we do believe that a semiotic description can satisfactorily face some of those challenges and deserves further articulation and application.

If an enactive perspective makes us focus on the origins and motivations of cognitive processes in the ongoing self-regulation of the autonomous system, functionalism leads us to focus on the importance of an unbiased perspective on the components of cognitive processes, avoiding giving undue primacy solely to the neuro-physiological substrate or to brain structures (cf. Clark 2008) since we have seen how they are co-constituted within a plurality of horizons (socio-cultural, technological, linguistic, etc.). A few convergences and comparisons between enactivism and functionalism have been attempted (Di Paolo 2009, Rowlands 2009, Menary 2010, Cappuccio & Wheeler, infra). Our semiotically oriented perspective contributes to the debate by showing that when culture, language and signs enter the cognitive scene, enactive processes are projected on a much wider arena where the organism-grounded motivations and values are without being denied re-constructed in co-dependence with these new horizons. This semiotic perspective could thus lead towards a functionalist perspective *de iure* aiming at not identifying cognition with the particular phenomena and the particular substances in which it is embodied and, at the same time, aiming at acknowledging the actual dif-
ferences that this embodiment and the different interacting dimensions determine. Human cognise (also) through the body and through the neural system and that makes an actual difference. But they do so widely relying on the environment, other agencies and socio-cultural dimensions and they reshape and redefine the biological constraints in many non-trivial ways, escaping and redefining the boundaries of the organism, to the point that the individual organism can in certain cases become but a part of more complex cognitive entities.\textsuperscript{11} If the parity principle (Clark \& Chalmers 1998) states the cognitive nature of external processes as long as they fulfill the same functions as internal processes, this position has to be re-assessed in the awareness that it is by the co-constitution of biological, physical, intersubjective and socio-cultural dimensions that (human) cognitive processes are by large defined. And the challenge is thus to effectively re-assess and integrate analytical methodologies in order to investigate these dimensions – like the ones developed by semiotics – at different time scales into the practice of cognitive sciences to complement the results and procedures already achieved at an individual and biological level.\textsuperscript{12}

As it should be clear by now, by speaking of a structural conception of cognition we do not mean to oppose a functional and processual perspective (as for instance in structural magnetic resonance imaging opposed to functional magnetic resonance imaging). On the contrary, this structural notion of cognition simply defines for us a functionalism 	extit{de jure} imbued by the enactivist reflection on the motivation of cognitive processes and on the crucial role of human biological specificities but also of institutions, culture and interpretative habits. While a definition of cognition does not discriminate a priori between the different vehicles on which it relies, the analysis of a single distributed cognitive system cannot prescind from analysing the practice in which it is defined and the possible inter-

\textsuperscript{11} Cf. Tribble’s analysis of Shakespearean theatrical practices. At that time the actors performed “a staggering number of plays […] with relatively infrequent repetition, and with the additional demands of putting on a new play roughly every fortnight” (Tribble 2005:135-6). Moreover the players did not have the full text at their disposal for memorisation but only their own parts and cues on the rest. These impressive cognitive achievements were possible only through a sapient use of stage props, spatial means of organisation of the stage invested with stereotypical meanings. Roughly, the Globe’s artefacts served to get the actors to the right place at the right time for further local environmental alterations (such as a particular line or event on stage) to call forth spontaneously the required specific behaviour. “So before we even consider the mnemonic and action-guiding nature of the plays themselves, or the broader hierarchical social system of the playing companies, we can see that a wide array of factors conspire to solve the various coordination and memory problems facing the company. Contrary to any default assumption that the overall play is controlled by a single plan in the mind of Shakespeare as writer or Shakespeare as director, or by a single authoritative script, in fact the sequences of actions and interactions which collectively constitute the performance ‘need not be explicitly represented anywhere’” (Sutton 2010:203).

\textsuperscript{12} For some early examples of this, see Deacon 1998, Donald 2001, Roepstorff 2008, Louwerse 2010.
nal local hierarchy on which cognition *de facto* depends. With the word “structural” we want to refer at the same time to the functionalism that was implicit in European structuralism\(^\text{13}\) and to the notion of structural coupling at different time scales that is at the foundation of Francisco Varela’s enactivism. That’s what we mean with a structural conception of cognition: a functionalism *de iure* able to draw some differences *de facto* that can keep together the crucial insights from distributed cognition, extended mind hypothesis and enactive thought theories. An hypothesis whose productivity we want to keep on testing and articulating in future works.

**Cappuccio & Wheeler**

Massimiliano Cappuccio and Michael Wheeler go to the theoretical core of the issues debated in “The External Mind”, debating the role of human symbolic practices and of their internalisation in the individual cognitive system in a distributed approach to cognition, opposing on this issue enactive approaches and the extended mind hypothesis.

Human beings engage in a plurality of cognitive practices that involve the storage and manipulation of information and the body is the first support for these operations. Human cognition begins being human when it achieves “a transfiguration of the motor intentional level of action (moving in accordance with a body schema for achieving a goal) into a communicative level of action (moving in accordance with an internal embodied simulation of the other’s perspective toward the goal)”. Cognition becomes human through pointing and using the body to represent something in a dance. Once such practices evolve into a structured material culture they are likely to re-organise at least some of the previously non-representational processes of cognition “in a (perhaps minimally) representational way”.

These phenomena are the benchmark for enactivism and the extended mind hypothesis. Enactivism focuses on the constitutive capacity of the organism to define a valence or significance to interactions and structural couplings with the environment according to their benefit for survival. Cognition at its core is rooted in this non-representational capacity of an autonomous system to self-regulate its own situation in an environment in accordance with its capacity for sense-making. However, this focus on non-representational skills hinders the capacity of enactivism to describe and explain the radical change in human cognition brought on by symbolic practice.

The extended mind hypothesis embraces instead a full functionalism that rejects the organism having any special role: the focus is on the functional role that states and processes play in the generation of personal-level cognitive phenomena, independently from their location and nature. Therefore external symbols and representations have (potentially) as much role in cognition as non representational skills. Therefore
– Cappuccio and Wheeler argue – the extended mind hypothesis is our best bet to describe and explain human cognition and its relying on symbolic practices.

**Gallagher**

Shaun Gallagher’s article is based on a double move: answering those who think that the extended mind is an over-extension and extending it further via processes that occur in interaction with other agencies and within social and cultural institution. Mind has to be conceived not as a repository of propositional attitudes and information, but as a dynamic process involved in solving problems and controlling behavior and action that human beings extend by engaging with the environment - tools, technologies, and institutions. Gallagher’s specific case study is the legal system. The idea is that contracts - as legal agreements - are the expression of several minds externalized and extended into the world, instantiating in external memory an agreed-upon decision, adding to a system of rights and laws that transcend the particularities of any individuals mind.

The limits of cognition are maintained by a criterion of Lockean ownership, that is the ownership of a cognitive process is constituted by the work invested in it, for instance by the involvement in the legal system, in recovering informations, consulting experts, etc.

**Paolucci**

Claudio Paolucci tackles the relation between cognition and mind through a detour in Charles Sanders Peirce’s pragmatism. In this perspective mind is but a sign of distributed processes and therefore “external”, or better, beyond the distinction between “internal” and “external”. Through the individuation of a pragmatist ancestor to the situated turns of cognitive sciences Paolucci sketches his proposal of a semiotic epistemological framework for the situated turns of cognitive sciences that should – given time and adequate investigations – contribute to dissolving the oppositions between mind and body and internal and external.

Paolucci follows Peirce’s steps in arguing that all cognitions are signs, that is, mediated by previous cognitions and projected towards further ones. The meaning of each cognition consists in its conceivable consequences, consequences that are conceivable relying on community- and environment-supported habits.

On this ground Paolucci attempts to go beyond the first formulations of the extended mind hypothesis in two directions: i) by defining the mind not as constituted by introspected mental states, but as a field where cognitions are manifested as signs of distributed processes and ii) by highlighting the problems in the parity principle due to its maintaining an external/internal divide.
Fusaroli

Riccardo Fusaroli’s article deals with the conceptual articulation connecting language and cognition and compares under this respect the extended mind hypothesis and the cognitive linguistic enterprise within the more general framework of Peirce’s pragmaticism. Fusaroli advances a habit-based conception of language and cognition inspired by Peirce and by semiotics that is able to keep together the two perspectives considered, overcoming their limits and magnifying the strong points of both perspectives. In such a conception, non-linguistic cognitive processes cross the internal/external dualism and basic bodily experience participates of the physical and intersubjective environment. Language dwells upon this embodied and systemic cognitive distribution, but thanks to its symbolic and public nature language widens the social horizon of cognition, allowing the intersubjective construction and the manipulation of affordances at different time scales and therefore changing the cognitive landscape on which even non-linguistic cognitive processes rely. Language thus reveal its crucial role in both dwelling upon and extending and complementing non-linguistic cognitive processes.

Granelli

Tommaso Granelli evaluates the degree of integration between different theories of situated action and distributed cognition. A semiotic perspective is thus set up to adequately emphasise the strong commitment to consider human experience and the cultural aspect of social activities, the resolute view of cognitive processes as not isolated “in the head” of human actors but rather ecologically distributed within an environment always comprising other agents and artefacts and finally the emphasis on the role of communicative resources in constructing and coordinating a social course of activities. The framework for a dialogue between cognitive sciences and semiotics is thus centred on four main tenets: i) system vs. process, ii) relationality, iii) mediation and iv) distribution.

Goodwin

Charles Goodwin makes a case for a strongly distributed perspective on communicative processes that nevertheless maintains a strong focus on individual cognitive agencies via the implicit double argument of Lockean ownership (cf. Gallagher *infra*) and intersubjective attribution.

Goodwin presents a plurality of analyses organised around a central case study: Chil, an aphasic man with almost no lexicon but nonetheless able to act as an effective speaker in conversation. These conversational skills display a strong spatial and temporal distribution in a plurality of semiotic processes and media. Chil’s broken sentences widely rely on interlocutors’ utterances and tentative follow-ups, on frameworks of reference shared by long established cohabition as well as by situational cues, on prosody and gestures, on material objects, etc.
The general vision of action and cognition is of cognitive agents “secreting diverse semiotic structure into a public environment where others build subsequent action through practices that include systematic transformations of the semiotic materials provided by their predecessors”. Single conversational actions contain within them a plurality of meaning making practices drawing on different semiotic processes – shared habits, indexicality, iconicity, etc. – and in their being public on the presence and the further actions of different kinds of actors. While the conversational skills emerge through a distributed bundle of practices and resources, Chil’s individuality is not lost. It is explicitly acknowledged by the participants that Chil relies on, controls and sanctions this distribution.

**Kirsh**

David Kirsh’s article analyses the practice of marking, that is, the practice of “a dancer that executes a dance phrase in a simplified, schematic or abstracted form”. When marking, dancers use their body-in-motion to represent some aspect of the dancing moves they are thinking about. Kirsh’s hypothesis is that marking “is more powerful than mental simulation alone” and that “recruiting the body might increase the power of thought”. Indeed, “by externalizing their movements, dancers are able to create an object of perception that can be conceptualized and reconceptualized in ways that go beyond mental simulation”. The practice of marking offers a particularly interesting perspective on the issues dealt with in this issue: marking is a form of “bodily thought” that lies between the internal simulation of the movement that will have to be performed and the performance itself: indeed it is a “form of practicing that is not completely internal simulation, but not completely external production either”. Marking is a practice that is not reducible to the dichotomy between internal and external and therefore particularly interesting for a semiotic perspective. Marking is the bodily simulation of an heterogeneous movement in which relevant traits are selected in order to improve the performance of the real gesture through the construction of a plan of expression that in semiotics we would call “hypoiconic” and “diagrammatic” (Stjernfelt 2007). Kirsh articulates such a process through the notion of “projection” and investigates the unfolding of marking as an example of what it means to “think with body and world” and therefore to integrate heterogeneous elements in the constitution of a distributed cognitive process.

**Rosero, Lecusay & Cole**

Rosero, Lecusay & Cole present in detail the applications of Cultural Historical Activity Theory (CHAT) to articulate the way historically sedimented practices, intersubjectivity and artifact-mediated activity contribute to distributed cognitive systems. CHAT is an ethnographical method consisting in informal participant observation through which
Rosero, Lecusay and Cole analyse the activities at the Town & Country Learning Center in San Diego. At TCLC children and teenagers from an economically depressed area engage in scientific and educational activities through play and unstructured activities. The authors investigate how at every level of the project from the observed activities to the observation itself as well as in the discussion of the results dialogic perspectives are involved. Different individual and organisational perspectives, historically established and evolving practices and contexts of practice and technological devices, generate joint engagement that entails a degree of ambiguity ranging from conjuncture to disjuncture (or “ambiguous coordination”). The importance of this contribution lies in its investigating the clashes and different perspectives and not only the smooth integrations involved in the distributing of cognition. The emerging image of distributed cognition is thus polyphonic, a field of (ambiguous) coordination and evolution.

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