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The Social Horizon of Embodied Language and Material Symbols

1. Introduction

If the mind is external – as this thematic issue of Versus provocingly states –, if cognition is not just something that happens beneath the skin but also and importantly “out of our heads” (Noë 2009), language – given its pervasive role both in thinking, everyday life and specialised activities - is an obvious place to look for whether and how this happens. In a traditional information-processing view – as prototypically portrayed by the information theory developed by Shannon and Weaver (1949) – language is simply a code that allows the transmission of previously elaborated information from one cognizer to another, just another kind of input and output. This model was developed to describe and improve the transmission of information through telephonic cables, where it had a perfect adequacy. It became, however, the prototype and legitimising model for a widespread conceptual metaphor – or ideology (Leezenberg 2011) - COMMUNICATION AS A CONDUIT that is still widely implied in common-sense (Reddy 1979, Lakoff & Johnson 1980, Grady 1998 and Semino 2006), as well as in philosophical and scientific conceptions (Ronchi 2003, Leezenberg 2011). But what if we do think through language and not in isolation but through conversations – linguistic or not – between ourselves and others, between ourselves and cognitive artefacts like books, software and devices, between ourselves and the culture we are embedded in?

Indeed, both the conception of cognition as a coding/decoding function cushioned between input and output and this radical divide between cognition and language are being questioned in a crescent number of philosophical and empirical studies. On the one hand cognitive linguistics – following the lead of authors like Langacker, Talmy, Lakoff, and Frederik Stjernfelt for having thoroughly discussed parts of this paper with me.

1 I would like to thank Stephen Cowley, Paolo Demuru, Simone Morgagni, Nico Mouton and Frederik Stjernfelt for having thoroughly discussed parts of this paper with me.

2 Mind and cognition are clearly not the same. Mind involves - for instance - dimensions of self-awareness that are not necessarily implied in cognition. For simplicity’s sake, I will focus here on cognition, leaving the discussion of mind to other works (but cf. the introduction of this volume and Paolucci infra).

3 This conceptual metaphor was around long before Shannon and Weaver, albeit in different forms. Cf. for instance John Locke’s Essay Concerning Human Understanding: “For language being the great conduit, whereby men convey their discoveries, reasonings, and knowledge, from one to another, he that makes an ill use of it, though he does not corrupt the fountains of knowledge, which are in things themselves, yet he does, as much as in him lies, break or stop the pipes whereby it is distributed to the public use and advantage of mankind.” (Locke 1698: 3.11.5)
Johnson, Turner, Fauconnier, etc. – attempts to reintegrate – and often reduce – language production and comprehension in cognition, showing their being shaped at different levels by the sensorimotor system. On the other hand, situated and distributed cognition approaches attempt to investigate what language adds to – and how it reshapes – non-linguistic cognition. Particularly representative, Andy Clark (2006) developed the concept of material symbols as a crucial element of the “extended mind” hypothesis; Shaun Gallagher and Dan Hutto (2007) sketched how linguistic narrative practices could explain higher level understanding of the minds and actions of others and Kristian Tylén and colleagues (2010) investigated language as a tool for interacting minds in establishing a shared level of cognition.

The aim of this article is to compare explicitly and articulate two key approaches to the cognitive nature of language using the concept of habit which is inspired by Charles S. Peirce’s pragmaticism and semiotics. The symbolic nature of language and its embodied motivation can be held together within an intersubjective and social horizon that articulates, constrains, negotiates and sometimes denies motivations and symbolicities at play. Thus a pragmaticist view of cognition can become the horizon within which cognitive linguistics and an extended mind hypothesis complement each other.

To do so, i) I will sketch a basic – and underarticulated – definition of cognition which in crossing different trends in cognitive sciences can be articulated with Peirce’s pragmatism and his concept of habit. ii) this framework will be put to the test through re-articulating the debate between two apparently opposite positions on the relation between language and cognition: that of cognitive linguistics and that of the extended mind hypothesis. Finally, iii) the concept of habit will be applied in order to re-construct the articulation of language as social cognition.

In certain contexts “cognitive linguistics” refers to Chomsky’s syntactical theories. I refer here exclusively to the tradition born from the authors just referred. For an up-to-date treatment of this cognitive linguistics: Geeraerts & Cuyckens Eds. 2007.

I use the term “pragmaticism” as per Peirce’s decision in 1905, when he distanced himself from James and the other pragmatists of the time. “Pragmaticism” was in Peirce’s eyes “a name ugly enough to be safe from kidnappers” (CP 5.414)

With “intersubjectivity” and “intersubjective” I will from now on refer to interactions where one or more people are directly involved in a dialogic process of coordination (cf. Matusov 1996; Rosero et al infra). With “social” I will refer to a normative dimension which is due to an agency that transcends the individual (a social institution for instance): this normative dimension does not, anyway, directly determine the individual, it is instead a tendency that, while transcending the individual, can be accessed through critical reflection and employed locally as a resource or manipulated. Two people having to pass through a door will reciprocally coordinate in a dialogic way since both of them are active participants in the interaction. This is the local intersubjective aspect. The social dimension can be found, for instance, in the tradition of letting the woman pass first, a tendency that can be locally engaged following it, or consciously accessed and made object of a (lame) joke: “I’d let you pass but we would then be a cliché”. 
2. The cognitive stance

2.1 What is cognition?

When cognitive science was born in the fifties, its revolutionary object was cognition, a level of “mental representation” that was analyzed as wholly separate from a biological or neurological level on the one hand and a sociological or cultural level on the other. Mental representation is the level of internal mediation between input and output, perception and action which was largely ignored by behaviourism and which can be described as language-like components and language-like structural composition, composed and manipulated according to purely formal criteria. In the effective words of Susan Hurley (1998), cognition as (manipulation of) representation is the filling of a sandwich. Concepts – the bricks of this mental representation – are thus the inner layer that mediates between action and perception, 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.

If this initial idea of cognition was explicitly formal and often based on the symbolic manipulation of predicates standing for features of the external world (cf. Fodor 1975 and the classical view on concepts in Smith and Medin 1981) – many radical developments have taken place in the following fifty years and more of research: neural networks (Clark 1989), dynamical system theory (Port & van Gelder Eds. 1995, Kelso 1995), embodiment (Gibbs 2006), situated (Robbins & Aydede Eds 2009) and distributed (Hutchins 1995) approaches. What is constant in these approaches is the presence of a certain amount of mediation in the human (or animal) approach to the world, a mediation that becomes more and more explicitly operational in contemporary developments. This mediation – be it called representation or not – is explicitly articulated by, for instance, Francisco Varela, Evan Thompson and Eleanor Rosch (1992), Andy Clark (1997), Susan Hurley (1998) and Lorenzo Magnani (2010) as constitutive of even the way that basic biological structures are engaged in
cognition. This conception was already at the centre of Peirce’s pragmatism and semiotics connecting meaning to possible action (cf. Rosenthal 1994) and recovering it – in particular the concept of habit – can provide us with some useful conceptual tools to work on these themes conceptually and analytically.

2.2 A Peircean view on cognition

One of Peirce’s main battles was waged against the idea of dyads, of unmediated relations of action and reaction, of stimulus and response. This was so because the basic element of any semiosis, including cognition down to perception, is a triadic relation.9 Even the most basic sensorimotor phenomena – the burning feeling due to an incautiously handled Italian moka espresso maker and the automatic withdrawing of our hand (cf. Eco 2007) – is already triadic, connecting an object (the proximal stimulations) to an interpretant (withdrawing the hand) through the selection or the construction of a common ground (the tendency to avoid damage). It is only because of the practice of making a coffee, of avoiding burns and the expectation of not being burned that we withdraw the hand from the moka. Given the awareness of the temperature and of the need to move the burning moka quickly into the sink, we would be able to respond to the proximal stimulations in a different way. This triadic conception is grounded on a purely topological principle (cf. Paolucci 2008) in which the three elements at stake – which Peirce calls object, sign and interpretant – are pure positions that can be filled in, in principle, by any element, as long as we keep in mind the crucial point that each is definable only by its relation to the other two. Cognition – in Peirce’s eyes as well as in many contemporary cognitive scientists’ – is the way through which reactions to the world are mediated and constituted, in order to escape being immediately determined by the environment, perceiving its regularities and affordances, manipulating them, and – sometimes – representing and storing them – although in ways that we still have to fully understand (on the attempts at understanding the functions and mechanisms of memory cf. Glenberg 1997, Sutton 2009).10

9 Articulating the concepts of (human) cognition, semiosis, and information processing in Peirce would require a long philological article (cf. For instance Fuhrman 2010). For our current purpose – the implications of Peirce’s pragmatism for the articulation of language and cognition – such notions may be considered equivalent, all sharing a triadic structure. The general system of triadic structures constitutes in Peirce a cosmological principle. Here I consider only its cognitive/phenomenological applications (following here Stjernfelt 2007). For a wider perspective: Sini (2000).

10 It could thus be said that in the current debate between enactivism and functionalism – well articulated in Cappuccio & Wheeler (infra) as well as in Di Paolo (1999) – this position seems to take the organism stance, which is an enactive stance. However, I detach myself from standard enactivism in at least two directions as we will see in the rest of the article: i) the organismic level is already crossed and defined in important ways by systemic dynamics; ii) once symbolic instances enter the picture the basic sensorimotor and regulatory capabilities of the organism get deeply reshaped.
2.3 How does this mediation work?

This conception of cognition has continuity at its core, a continuity which is the constitutive possibility of constructing a third entity that enables the organism to pass from a stimulus to a non-direct reaction, from one thought to another, and even to search for and construct specific stimuli, instead of being a passive receptor of stimulations. Even more radically, this conception of cognition could be defined as making these different elements continuous, showing how they participate to the constitution of cognitive processes. This continuity is not, though, a shapeless continuum where everything can be connected in any circumstance to everything else, the much dreaded spectre of unlimited semiosis. This continuity has a structure: the sign – the active link between object and interpretant – is made possible by already established and/or locally negotiated habits. Acts of perception or cognition do not happen in the void, they rely on socially shared practices, they are enacted through sensorimotor skills and constraints and/or imbued with conceptual knowledge and they are primed and framed by previous local cognitions. Even the most basic and apparently direct perceptual acts like the ones we perform in the case of the following picture – the Müller-Lyer illusion – are deeply mediated.

![Müller-Lyer Figure Illusion](image)

The perception of two segments of the same length as being of unequal length is a direct experience, which is, however, only made possible only through the operational mediation of having perceived and acted in a prevalently orthogonal environment, something which is due to our architectural practices. We therefore interpret the arrows as square angles distorted by different distances and adjust the length perception. This is true to the point that for instance the San foragers of the Kalahari who are not used to urban architecture and whose hunting and foraging practices call for careful aiming within few meters of distance do not perceive the illusion (cf. Segall et al. 1966). Habits are exactly what, on the ground

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11 On this distinction between two conceptions of continuity that cross the history of Western thought, cf. Salanskis & Sinaceur 1992; Stjernfelt 2007; Fabbrichesi Leo & Leoni 2005; Fusaroli 2008.
of wider practices, structure the possibility of these different experiences. On this more general ground the single cognition/perception attains increased informative power (iconicity) something which enables the subject to proceed further in her perception, action and interpretation (Eco 2007; Stjernfelt 2007; Fusaroli & Morgagni 2009). Habits can thus be defined as the structure of continuity, “praxeologic operative principles” (Fabbrichesi & Leoni 2005), as dispositions to act/interpret/perceive in a similar manner in similar situations (Peirce 1931-58, CP 1.148, 1.157, 6.612).

For the present discussion of the articulation between language and cognition I will further articulate three of the main elements of the definition of “habit”: its flexibility; the fact that it is distributed and its strong reliance on a social and intersubjective horizon.

2.3.1 Habits as flexible tendencies

We have already seen how cognitive acts are situated in an interpretive practice, that is, in a trajectory connecting objects and interpretants, thus being open to an interplay between existing tendencies, practices at play, local contexts and phenomena. In Peirce’s words:

“this law of habit seems to be quite radically different [...] from mechanical law, inasmuch as it would at once cease to operate if it were rigidly obeyed: since in that case all habits would at once become so fixed as to give room for no further formation of habits. In this point of view, then, growth seems to indicate a positive violation of law (Peirce 1931-58, CP 6.613)"

12 If we have already noted how this article does not treat the cosmological valence of Peirce’s theory, we have to add here an additional restriction. The cognitive import of habits is crucial in all animal and artificial cognition. However, only human cognition in its specificities – i.e. the role of the social dimension and of language – is here explicitly considered. Even in this restricted acceptance, as we will see, the concept of habit constitutively escapes the boundary of the individual.

13 Cf. also “Were the tendency to take habits replaced by an absolute requirement that the cell should discharge itself always in the same way, or according to any rigidly fixed condition whatever, all possibility of habit developing into intelligence would be cut off at the outset; the virtue of Thirdness would be absent.” (Peirce 1931-58 CP 5.390). However, Peirce was not the first to discuss the concept of habit. Even not going back to the usual Aristotle we can quote Camic’s reconstruction of the debate in the 18th century: “To many, the notion of habit immediately conjures up behavior that consists in a fixed, mechanical reaction to particular stimuli and is, as such, devoid of meaning from the actor’s point of view. In sociology, this image is one that became fairly widespread early in this century, though it was already current in the 1780s [...] and alive during the interim as well. The point to note, though, is that the image has also met with substantial opposition. In place of the idea of a fixed, mechanical reaction to stimuli, it has been held that habit creates a stable inner core that affords immunity from external sensations and impetuous appetites [...]; that it is not by such stimuli as these, but by the ego itself, that habit is called into play and allowed to proceed, with leeway for situational adaptation [...] and that, however much habitual action may be removed from “hesitation and reflection,” such action is still no more
We can thus define habits as regularities and not rules; using a dynamical systems theory metaphor, *habits are attractors*, that is, tendencies whose profile depends “on the overall state of the organism involved in some activity and past basins of attractions created within the system” (Gibbs 2006: 115). Thus habits are constitutively situated, adaptable to contexts and open to learning and modifications. This is the basis of what has been called Peirce’s pluralist realism, an attempt to expand realism to the growth and evolution of knowledge and organisms (Rosenthal 1994).

2.3.2 Habits as flexible tendencies of distributed cognition

Gibbs defines attractors as “basins of attractions created within the system”, the system not being the same thing as “the organism” mentioned a few words earlier. This is a crucial element of the theory. In Peirce’s words:

To begin with the psychologists have not yet made it clear what Mind is. [...] Feeling is nothing but the inward aspect of things, while mind on the contrary is essentially an external phenomenon. The error is very much like that which was so long prevalent that an electrical current moved through the metallic wire; while it is now known that that is just the only place from which it is cut off, being wholly external to the wire. Again, the psychologists undertake to locate various mental powers in the brain; and above all consider it as quite certain that the faculty of language resides in a certain lobe [...]. In my opinion it is much more true that the thoughts of a living writer are in any printed copy of his book than that they are in his brain. A psychologist cuts out a lobe of my brain and then, when I find I cannot express myself, he says, ‘You see your faculty of language was localized in that lobe.’ No doubt it was; and so, if he had filched my inkstand, I should not have been able to continue my discussion until I had got another. Yea, the very thoughts would not come to me. So my faculty of discussion is equally localized in my inkstand. [...] It is plain enough that the inkstand and the brain-lobe have the same general relation to the functions of the mind. (Peirce 1931-58, CP 7.364-6. For a discussion and an extensive investigation of the echoes of this conception in Peirce’s works cf. Skagestad 1999. For a comparison of Peirce’s perspective with the extended mind hypothesis cf. Paolucci *infra*).

Indeed “operational mediation” does not need to be explicit internal computation, be it performed on the spot, or ontogenetically developed modifications as in the case of the Müller-Lyer illusion. Wearing glasses changes our perceptual and cognitive responses and constantly writing papers with a word processor creates habits, ways of thinking and acting that are constitutively computer-supported, for instance the readiness to “mechanical” than action of the same type that emerges from wholly reflective processes [...]” (Camic, 1986:1046).
undo an action or copy and paste something which becomes an integral part of the habits of any skilled computer user (plus her computer) sometimes making itself explicit when the author of the present article deals with printed out papers and automatically feels ready to push Cmd-C and paste some quotations in the open word processor on the screen. Participating to a successful joint action creates stronger propensity and motivation to cooperate even on tasks that would be better performed by a single individual (Richardson et. al. 2007). Moreover organisms tend to modify the physical and cognitive environment and thus the system which they form with it. Inserting a post-it in a book will act as a focus for successive attention, making certain pages and passages more pregnant for our perceptual and cognitive process. Habits emerge through ecological interactions within and manipulations of a physical environment that is also profoundly shaped by social and cultural structures relying on this environment and stabilizing regularities of interactions as a “demicadence which closes a musical phrase in the symphony of our intellectual life” (Peirce 1931-58, CP 5.397), in order to tentatively make action and cognition more effective, less costly or in other ways more fit. And this often implies relying widely on the physical and social environment and on the ongoing interactions with it.

2.3.3 Habit as a community-supported flexible tendency of distributed cognition

The social and intersubjective distribution of habits is but a subset of the general distribution of habits I dealt with in 2.3.2. However, these intersubjective and social dimensions will be further articulated for two reasons: i) many treatments of Peirce’s crucial concepts of habits and diagrammatic reasoning as applied to cognition neglect this aspect of human habits; ii) when language enters the picture, the already present intersubjective and social horizon of cognition becomes so pervasive that it is impossible to ignore it.

If the previous paragraph showed how cognitive processes do not seem to care at all for the traditional boundary of the skull, the path to them being intersubjective or even social is open. Unfortunately, Peirce does not extensively\textsuperscript{14} elaborate on that. He does – anyway – insist on the importance of the community of inquirers. The community has a cosmological importance:

The real is, then, that which, sooner or later, information and reasoning would finally result in, and which is therefore independent of the vagaries of you and me. Thus, the very origin of the conception of reality shows that the conception essentially involves the notion of COMMUNITY,\textsuperscript{14}

\textsuperscript{14} There is, however, an explicit treatment of the dialogical nature of logic in the development of the existential graphs, more specifically in the passage between the Graphist and the Grapheus. Cf. Pietarinen 2006.
without definite limits, and capable of a definite increase in knowledge. (Peirce 1931-58, CP 5.311)

Moreover, the community has a normative importance in the definition of the proper fixation of belief and therefore an ideal, ethically responsible and ultimately adequate cognitive reasoning: “logic is rooted in the social principle” (Peirce 1981-, W: 284). Peirce sometimes goes beyond this, moving from explicitly stating the normative and ideal nature of the social principle to a naturalisation of it. In “The fixation of belief”, indeed, Peirce states that the method of (individual) tenacity, which consists in stubbornly holding on to dogmas and previous beliefs “will be unable to hold its ground in practice. The social impulse is against it [...], an impulse too strong in man to be suppressed, without danger of destroying the human species.” (Peirce 1981-, W: 248). What happens is that stubborn certainty cannot hold the ground against a social instinct, the opening of an intersubjectively grounded doubt and negotiation and potentially the growth of signs (Peirce 1932-58, CP 6.613). This social instinct has two sides: i) it is already there, “the [unavoidable] price we pay for awareness of the limits of rationality, of our inability to have immediate access to truth and reality” (Calcaterra 2001), the price for the constitutively semiotic and mediated nature of cognition; ii) but it is also an ideal horizon “something on which to graft their very use and meaning, the multiple possibilities for theoretical and practical developments that accompany our figure as “artificers of knowledge” (ibidem).

Without having the possibility here to go into further details, we can note how this social dimension in the texture itself of the habit, as a necessary ground and support for its existence, is a continuum in which three categories of habits can be hypostatized and articulated:

A normative and explicit layer that is socially defined. This can either be inherited from social institutions (from “do not carry a gun unless authorised”, to “open the door for the lady”, and so on) or locally established and explicitly negotiated (from “Do not use my milk from the common fridge” to “Do not eat the fruits on that tree”).

A principle of social normativity analogous to Bourdieu’s habitus, that shapes in-

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15 A recent experiment shows how the presence of the picture of eyes over the departmental fridge at the Department of Psychology in Newcastle doubled the payments for the use of milk from that same fridge – as opposed to a control situation where a picture of flowers was displayed (Bateson et. al 2006). It thus seems that if this very simple trick on a tree carrying certain forbidden fruits the whole – frankly embarrassing for all sides – situation of the original sin could easily have been avoided.

16 Social groups create “systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles which generate and organize practices and representation that can be objectively adapted to their outcomes without presupposing a conscious aiming at ends or an express mastery of the operations necessary in order to attain them. Objectively ‘regulated’ and ‘regular’ without being in any way the product of obedience to rules, they can be collectively orchestrated without being the product of the organising action of a conductor” (Bourdieu 1980: 53)
individual performances without necessarily being explicitly formulated or present in the awareness of the individual. We can find empirical evidence of this, for instance in the fact that even at a basic level of motor resonance (the unconscious motor coordination between individuals) there is an important shaping effect exerted by more global factors: established social roles and the memory of previous interactions, amongst other things (for a review cp. Smith & Conrey 2009). Other examples are more explicit changes in behaviour and cognitive practices due to different social contexts and difference in social and functional roles (Hutchins 1995) or the concept of affordance as expressed by Gibson (1979:139) that – at least in some passages – seems to be motivated exactly by this social dimension: “the real postbox [...] affords letter-mailing to a letter-writing human in a community with a postal system”. It is thus on habits as socially pre-established components that local interactions rely – while potentially re-modulating them. Very local principles of negotiation, coordination and synchronisation. The cognitive role of motor resonance, joint attention and joint action is by now widely accepted (cf. Sebanz, Bekkering, Knoblich 2006). These mechanisms support the prediction of the actions of others and the natural integration of one’s own behaviour with that of others, they allow building the actions of others into the structure of the common task and, as is argued by Hurley (2006), they cross the divide between personal and subpersonal. In other words, synchronisation and co-ordination are not (only) the result of a conscious effort of a subject, but also act at a more basic cognitive level below the habitual level of consciousness. Research shows that successful conversations involve the coordination of postural sway of participants, even in the absence of visual contact (Shockley et al. 2003); and that successful collaboration on a task shifts perception of affordances of the environment from those appropriate for individual capabilities to those matched with the capabilities of the group (Richardson et al. 2007). Whatever “operational mediation” is needed to perform the tasks, it has to be in an important way intersubjective, since the participants are constantly tuned to each other and to the system that they constitute together and they rely on this constant attunement in order to perform.

Habits are community-supported flexible tendencies that deeply shape our reality both because they are the inescapable mediation that allows us to

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17 The distinction between personal and subpersonal is generally reconducted to McDowell (1994) according to whom personal level explanations involve the constitutive character of agency and will – elements that dominate our folk theory of mind. Subpersonal level explanations are instead involved with states and mechanisms that causally underpin personal level phenomena and that can, according to our arguments, lie beyond the boundary of the individual – and of the individual agency.

18 Given the nature of the habit and the fact that this taxonomy is in fact a continuum, I’d like to stress i) the fact that any normativity previously mentioned is somehow flexible, negotiable and social and therefore – potentially – in evolution; ii) that the conscious/unconscious divide is relative and it is often possible to cross it – at the very least through the aid of scientific investigation as the authors mentioned do (cf. Adamson 2005).

19 Community in this Peircean understanding thus assumes a plural articulation that we can here only point at: i) the individual awareness of a social horizon in which the individual operates; ii) the implicit regulative effect given by repeated interactions between subjects belonging to a somehow delimited social group; iii) the vertical regulative effect due to the sedimented background of practices and more generally to cultural artifacts and norms inherited from previous generations.
access and act in the world, but also because they reshape the world in its social and even physical aspects, through the creation of material artifacts (cf. Heidegger’s example of the chair, for instance) and propagates behaviour and ways of thinking. Habits, as structures of a praxeologic operative continuity, define cognition in terms of its “conceivable consequences” (CP 5.402, CP 6.481), in terms of opening and constraining possibilities to further act, perceive, interpret: possibilities that are due to the systems to which individual cognitive systems are or have been or could be coupled. Having thus defined our framework, it is time to turn our gaze specifically to language, in order to sketch two of the main approaches to language and to evaluate and articulate them through the pragmaticist conceptual framework just sketched.

3. Cognitive stances on language

3.1 The embodied turn: Language in the brain/body

As part of the cognitive sciences, cognitive linguistics considers language a psychologically real phenomenon. As opposed to previous cognitive approaches – Chomsky’s models in primis –, language is not conceived as the effect of an autonomous brain module: “language is an integrated part of human cognition which operates in interaction with and on the basis of the same principles as other cognitive faculties” (Evans & Green 2006: 50). According to this approach cognitive semantics “is chiefly concerned with the study of the relationship between experience, embodied cognition and language” (ibidem). Linguistic usage and interpretation is a product of cognitive systems, which is why we need to take into account cognitive domains and faculties such as bodily and mental experiences, image-schemas, perception, attention, memory, frames, categorization, abstract thought, emotion, reasoning, inferences, etc.

These positions have provoked perplexities and hard critiques, since they have been interpreted as an attempt to reduce the specificities of language in its social dimension to a conceptual – or pre-conceptual – level which is internal to the individual (cf. Rastier 2001; Sinha 1988; Zlatev 1997 and 2010). Certainly certain statements from authors like the following may point in that direction:

“Cognitive Linguistics focuses on mental, conceptual entities as legitimate objects of description in their own right” (Harder 2007:1247) or even “qualitative mental phenomena” (Talmy 2000);

“There is a unique representational level, the conceptual structure, in which linguistic, sensory and motorial informations are compatible. [...] For this reason to study semantics is to study cognitive psychology” (Jackendoff 1983:19);

“An ordered conception necessarily incorporates the sequenced occurrence of cognitive events as one facet of its neurological implementation” (Langacker 1986: 455);

“The brain is thus the seat of explanation for cognitive linguistic results” (Dodge & Lakoff 2005: 71)
Such claims are reactions to both autonomous perspectives on language as well as to purely logical representations of cognition, but they imply the risk of a complete reduction of meaning and language either to the subjective domain or to the neurophysiological domain. But as we will see this is not the only possible articulation of language and meaning in a cognitive linguistic framework.\textsuperscript{20}

According to cognitive linguistics language is embodied in at least two ways: i) it is physiologically uttered (or written) and accompanied with gestures; ii) the meaning it conveys is grounded in the sensorimotor system. Indeed, one of the basic – and well argued for – claims of cognitive linguistics is that linguistic understanding and production, thought and interaction with the world all rely on widely the same circuits (cf. Barsalou 1999, 2009). Concepts – or more precisely conceptualising systems – are based on sensorimotor activity: we keep track of interactions with the world and re-activate these traces in context both to act and to think.

Language is a sequence of stimuli that orchestrate the retrieval of experiential traces of people, places, objects, events, and actions. [...] Language comprehension is grounded in the same knowledge and processes that are used to support comprehension and conceptualization in many other domains. [...] Through language we re-activate action potentials, mentally simulating these actions and thus grounding our capacity to plan and execute actions and to understand the actions of others” (Zwaan & Kaschak 2009: 368, but cf. also Gallese 2007; Gallese & Goldman 1998; Glenberg & Robertson 2000).

While the focus is still on the mental and potentially inner simulation of previous experiences, the “orchestration” metaphor – resonating with the idea that semantics is about “the [non-reductive] relationship between experience, embodied cognition and language” – seems to lead to a more articulated conception of linguistic mediation not just as a trigger, but as a creative element in the simulation. Moreover, the article goes on: “The experiential traces reflect the comprehenders’ past experience with particular objects, actions, and events, as well as their previous experience with language” (Zwaan & Kaschak 2009: 368). Language creeps into the explanation of language. This paves the way for the idea that once language is in place, the picture changes and it is impossible to reduce it to something else. But what is the specificity of language?

\textsuperscript{20} In particular we will see symbolic and social aspects - in their interrelation - through which cognition and meaning are shaped. It has to be noted that explicit mention of these aspects enters cognitive semantics already with some of the exponents of the second generation of cognitive linguists.
3.2. The extended turn: language (and mind) into the world

In mainstream cognitive linguistics and in most embodied strands of cognitive sciences (cf. Gibbs 2006), language seems to be – methodologically at least – an internal matter, that is, it has to be explained via processes that happen in the head. This is exactly the view that is opposed by the extended mind hypothesis (Clark & Chalmers 1997, Clark 2008). The extended mind hypothesis is based on a functionalist perspective supported by a strong evolutionary claim. The functionalist perspective is effectively expressed through the Hypothesis of Cognitive Impartiality (HCI):

“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) [...] It states that the biological control system does not care about differences of location or type of resource but simply uses whatever it can relative to some cost-benefit trade-off, to get the job done. (Clark 2008: 21-22)

This stance is backed by an implicit evolutionary claim: given that both evolution and development lead to optimised organisms and, in this case, cognisers, the most efficient way of cognising will be implemented. If the external environment can be co-opted in a way that results in less cognitive effort, then it will be co-opted. Thus, while a traditional perspective on cognition can be defined as brainbound - “the model of mind as brain

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21 The “extended mind” - it has to be noted – is a theory that deals almost exclusively with cognition – intended as some sort of information processing based tasks led (an aspect often left implicit) by some kind of conscious or unconscious human or organism-based intentionality – hardly accounting for consciousness and the phenomenological aspects of experience. An ironic stance since it is – at the same time – partly grounded on a phenomenological principle, the Parity principle: “If, as we confront some task, a part of the world functions as a process which, were it to go on in the head, we would have no hesitation in accepting as part of the cognitive process, then that part of the world is (for that time) part of the cognitive process” (Chalmers and Clark 1997, italics mine). In order to avoid this discussion here, I chose to rely on the more cognitively oriented Hypothesis of Cognitive Impartiality. But cf. Steffensen 2009, Adams & Aizawa 2008, Rowlands 2009 and Paolucci, this volume.

22 A “given” that pervades so much of the extended mind literature, but which should not be taken for granted, due to the intricate paths of evolution, exaptation and culture, cf Dennett 1995 and Gould 1997 for a discussion on these topics.

23 The engineering metaphor of optimisation as the organising principle of cognition is often backed up by and blended with capitalist and industrial metaphors: “From the perspective of HEC, the ancient biological skinbag is the handy container of persisting recruitment processes and of a batch of core data, information, and body-involving skills: Thus equipped, the mobile human organism is revealed as a kind of walking BIOS, ever ready to bootstrap into existence the larger soft-assembled cognitive systems that are quite literally, the information processing engines of much advanced thought and reason” (Clark 2008: 38); “It is the brain’s great plasticity and thirst for cheap, outsourced labor that drives the distributed engines of socio-technological adaptation and change. It is true, too, that by subtracting those meaty islands of wet organismic plasticity, the whole process grinds to a standstill” (ibid.: 62); “[we are] factory tweaked and primed” (ibid. 66); etc. Cf. Steffensen 2009.
(or perhaps brain plus nervous system)” (ibid: xxvii) – the extended perspective claims that when parts of the environment are coupled to a cognitive system in the right way, they become parts of the mind. Cognition is not necessarily extended but it may and often does depend directly or constitutively on non-neural structures, including – and extending beyond – the body.

The actual local operations that realize certain forms of human cognizing include inextricable tangles of feedback, feed-forward, and feed-around loops: loops that promiscuously criss-cross the boundaries of brain, body and world. The local mechanisms of mind, if this is correct, are not at all in the head. Cognition leaks out into body and world” (ibid.: xxviii)

This formulation implies and expresses that “the thesis of the extended mind is an ontic thesis, of partial and contingent composition of some mental processes” (Rowlands 2009). Cognition, as a matter of fact, in certain cases, and not in all of them, can happen through a coupling of the subject and the environment. The conditions for this coupling are four: i) the elements involved have to be constantly available; ii) their involvement must not encounter difficulties; iii) the elements involved must be automatically endorsed, possibly due to iv) a conscious endorsement happened in the past.24

In this picture, language – or as Clark says, material symbols – is “a form of mind-transforming cognitive scaffolding: a persisting, though never stationary, symbolic edifice whose critical role in promoting thought and reason remains surprisingly ill understood” (Clark 2008: 4). Non- or pre-linguistic cognition is non-arbitrary, modality-rich and context-sensitive: deeply embodied and deeply situated. The use of language allows human beings to circumvent certain limits of this system, since material symbols are material instances of public signs to which a specific meaning has been attributed by convention. Language thus grants cognition “a public system of essentially context-free, arbitrary symbols that push, pull, tweak, cajole and eventually cooperate with the biological skills” (ibid.: 47). Thanks to this relative independence from the context, language can be i) a source of additional targets for attention and learning (perceptually simple tokens that reify complex ideas); ii) a resource for directing and maintaining attention on complex conjoined cues; iii) together with more basic representational resources, the basis for new forms of hybrid thoughts. A very important point in this re-definition of the role of language is that at the same time: i) Language creates a mediational layer that can select and renegotiate aspects of the immediate content as well as de-

24 Clark, Chalmers and the other debaters do not elaborate too much on these points. We could re-read them in the sense that a habit has to be created, an automatic disposition of the system that involves the environmental elements. A Heideggerian approach would use the “ready-to-hand” category.
fine a completely different context, thus enriching reality and cognition.

ii) Language is constitutively imbricated in practice, in doing something, in coordinating something else, and not just a representation or a transfer of information.25

4. A habit-based stance on Language in Cognition and Cognition in Language

Comparing the previous two paragraphs we might think that we face two opposite stances on language:

On the one hand language is grounded on and expresses non-linguistic and embodied cognition that pre-existed it, and linguistic meaning seems to be a – potentially internal – embodied experiential resonance, an inner content only triggered by language.

On the other hand language is an abstract external device that is used exactly because it does well what modality-rich cognition could not do, and linguistic meaning seems to be external, defined by (social) convention and grounded in the materiality of the symbol.

A closer look, however, seems to reveal the possibility of a reciprocal articulation of the two perspectives. Cognitive linguistics opens the possibility of a space of manoeuvre. The fact that language “orchestrates” and “informs” the experiential resonance may be read as follows: language has an active role in the shaping of experience and grounds the way it is intersubjectively constructed26. In the same way, the extended mind hypothesis does not negate the more embodied and modality-rich dimensions of language and meaning, indeed claiming that it is through language that human beings are able to construct “new forms of hybrid thoughts”, which are still grounded in human embodied experience, but along dimensions that are more socially and linguistically articulated and that potentially reconfigure and articulate the grounding itself. If cognitive linguistics mainly focuses on two dimensions of embodiment – the sensorimotoricity of utterance and perception and the sensorimotor ground of concepts – there is, indeed, at least a third additional dimension that is often neglected. The body is indeed not just a physical body, with its size and weight, articulations and biological structures. The body is an active presence in the world: it shapes and at the same

25 And we are reminded here of the pragmaticist focus on the “conceivable consequenc-
es” that define the meaning of any entity or relation.

26 This is not to say that every single author in cognitive linguistics share this view or that it is not locally contradicted in certain theoretical statements. I am pointing out a theoretical possibility – in more than a few cases tackled via analysis and experiments – that has to be further articulated, but it is not as such incompatible with the cognitive linguistic enterprise, quite the contrary.
time it is defined through our activities. A perspective quite similar to the enactive approaches:

We propose as a name ‘enactive’ to emphasize the growing conviction that cognition is not the representation of a pregiven world by a pregiven mind but is rather the enactment of a world and a mind on the basis of a history of the variety of actions that a being in the world performs. (Varela et al. 1992:9)

We have already extensively argued – for instance – how crucial in the foundations of our cognitive system is the intersubjective systemic dimension. The body is defined and shapes human intersubjective coordination through posture, facial expression, aware and unaware gestures. Language is thus bodily grounded because it dwells on and takes further these active and intersubjective dimensions of the body, forming an articulated set of tools that allows us to act and operate both in the individual (self-directed internal language) and in the social context, extending the human possibilities of action in and manipulation of the physical and social world.27 And exactly this third kind of embodiment defines a third way for meaning to emerge, a way that crosses the divide between internal and intrinsic contents on one side and explicit social conventions on the other. Sense is made by the conceivable consequences of a linguistic structure, consequences that are certainly grounded on our physically and socially embodied experience, but which also evolved – and are crucially co-constituted – through further interactions with the world, including individual as well as intersubjective and social reflection on and manipulation of language.

Let us try to see how this perspective develops from our framework. We have seen cognition as an operational mediation, a triadic structure that enables us to open new spaces for possible actions that are not unmediated responses, and that allows organisms to actively search for stimuli and to manipulate the environment. This structure is not a priori confined to the boundary of the individual, but it forces upon us a systemic perspective, in crossing the inner/outer dichotomy and in redefining it as at most a post-hoc boundary. We have seen, for instance, that individual actions and perception of affordances might be grounded on intersubjective interaction, like motor resonance and joint attention, and that socio-normative dimension plays a role in these processes as well. In this conceptual framework, the articulation between cognitive linguistics and extended mind hypothesis finds a natural context: language becomes an additional extremely ductile layer through which systemic interactions are constituted, a layer that feeds back onto the other layers and re-shapes cognitive systems. It can be represented roughly in the following figure:

27 For a further review of how the body is not simply a physical device, but a social and semiotic entity: Ziemke, Zlatev & Frank eds (2007) and Frank, Dirven, Ziemke & Bernárdez Eds (2007).
Three interrelated factors can thus be (re)spelled out to better understand the role of language in cognition:

Experience: including its important embodied and non-linguistic dimensions as pointed out by cognitive linguistics, but also in its intersubjective, socio-cultural and often already linguistic dimensions.

Materiality: as pointed out by the extended mind hypothesis the sheer materiality of language creates a whole new horizon of manipulability – affordances – that was not present – or only to a lesser degree – in non-linguistic cognition.

Intersubjective and social horizon: materiality opens to a public horizon that widens and qualitatively changes the intersubjective grounding that we already saw at play in cognition. At the same time it is through this dynamical social horizon that the materiality of language makes sense and the whole of cognition is reshaped.

28 The terms in {} refer to the correspondent elements in Dynamical System Theory (Kelso 1995) that – used as a metaphor – inspired the drawing of this diagram.

29 As it is implied in the notion of affordance (cf. the debate between Niveleau 2006 and Morgagni 2010) materiality is conceived as embedded in socio-cognitive dynamics, in Peircean terms as Secondness (the resistances of the world) emerging on the ground of Thirdness (the expectations and general ways cognitive systems approach it with).

30 This social horizon does not imply any radical culturalism. Radical culturalism is the idea that the sign system of a society or a culture constrains, defines, and determines the individual to the finest detail of his actions. As we have seen in the previous paragraphs, the social horizon is always put to play and locally engaged as one of the – admittedly foundational – dimensions. Similar positions are expressed by Clifford Geertz: “human thought is basically both social and public – [...] its natural habitat is the house yard, the marketplace, and the town square” (Geertz 1973:45).
If a hypothetical initial use of language might have been a mere prothesis and immediate expression of the active body, it becomes language proper when it functions as the vehicle and support of shared habits structuring cognitive interactions. The presence of words and other linguistic structures as public signs creates an anchor for the co-construction and attunement of cognitive systems – even at a spatial and temporal distance – and a shared external support these systems can intersubjectively rely upon intersubjectively and which they can both explicitly negotiate and implicitly align. A non-exhaustive list of functions that language fulfills “as a tool for interacting minds” is provided by Tylén and colleagues (2010): i) to extend the possibility field for interaction in space and time; ii) to facilitate the structuring, profiling and navigation of joint attentional scenes; iii) to enable the alignment and sharing of situation models and action plans; iv) to mediate the cultural shaping of interacting minds. In this sense, language is a tool, or – not to forget Wittgenstein’s (1953) lesson – a set of different tools.

But we should not forget that at the same time language pre-exists the single speakers. Language is culturally passed from one generation to the next and is thus learnt again and again just through exposure to a sample of it and then suitably generalized and developed through further interactions with the linguistic and non-linguistic environment. It is not only an important part of the cognitive niche built by human beings a long time ago, but it also forms a permanent – and evolving – artificial environment. The sedimented constraints to cognitive interactions constitute the environment in which the speaker develops his cognitive skills and on which she relies to deploy them. The distributed deposit of articulated linguistic uses and idioms – de Saussure’s \( \text{langue} \) – has to be both at least in part interiorised and to be continuously coped with by the speaker in order for her to express herself and for her linguistic habits to consolidate and evolve within their social horizon. This is exactly what Peirce meant when he said that signs and men reciprocally educate each other. Language precedes the speakers as a bundle of pre-disposed linguistic habits and linguistically shaped non-linguistic habits that inform while not completely determining the expressive action of the individual situated in a specific community.

Thus we can point out – again – the double social nature of language: at the same time it dwells in the basic skills of intersubjective tuning and it extends the range of intersubjectivity widely in space, time and pervasivity. Linguistically socialised subjects do not simply engage with their own thoughts, but they interiorise and dwell on this public dimension – that

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31 Cf. for instance Vico’s narration of the origins of language or Deacon’s (1997) and Donald’s (2001) more scientifically fed genealogy of language. Cf. Also the idea of first order languaging in Love 2007.

32 Cf. Tomasello 1999 for a discussion of how symbolic activity might need joint attentional practices in order to develop.
is, for instance, they are able to interact with absent controlling agencies. The linguistic individual is thus subjected and defined by a plurality of more or less anonymous “thirds”, by a pluralistic dimension of flexible and negotiated normativity. On the one hand the individual monitors and adjusts these “thirds” as she sees fit, on the other they constitute the network of norms and values of the social reality through which the individual is formed and informed.33

In this framework it becomes easy to point out some of the potential shortcomings of the previously mentioned approaches when cognitive linguistics and an extended perspective on cognition are not reciprocally articulated. Experience is deeply shaped by an intersubjective and socio-cultural horizon that often relies on language. Therefore language cannot be a mere expression of non-linguistic schemas: it engages them in a more ductile arena, it aligns and negotiates them intersubjectively and socially and it contributes to the conditions of their formation and deployment. Two examples come to mind, already within the field of cognitive linguistics. Jordan Zlatev (2005) showed the influence of mimesis and Chris Sinha and Kristina Jensen de López (2000)34 the role of material artifacts and socio-cultural practices in the formation of one of the most basic structures of cognition: image schemas,35 which are supposed to constitute the ground for understanding language through pre-linguistic conceptual and pre-conceptual structures. Some other very persuasive studies are: i) the way different languages influence the way in which spatial relations are represented and the time line is conceptualized (Boroditsky 2001), ii) as well as the performance in absolute and relative spatial orientation tasks (Levinson 1997); iii) but also the evidences of the role of language in constituting a fully developed sense of body (Borghi and Cimatti 2010). Intersubjectivity, language and culture change the environment in which children develop, therefore shaping even their most basic physical interactions and cognitive processes.

At the same time, exactly because cognitive processes are grounded

33 In an initial footnote I stated our interest for cognition, leaving mind and phenomenology out of the scope of this article. Nevertheless they become relevant here, because it is exactly in this interplay that the problem of meaning is articulated. In a linguistic community we are ready to do something together according to a shared understanding of what we are doing, what we should be doing, what we are expected to do. It is this retroflected aspect of meaning that allows it to “make sense”.

34 According to Sinha and Jensen de Lopez (2000: 31) children employ social knowledge of the canonical use of objects in conjunction with their innate capacity for schematizing spatial relations. The image-schematic nature of cultural objects may be a prototypical ecological affordance that influences language (Sinha and Jensen de López 2000: 22). Thus, Zapotec children are not as quick as Danish or English children to notice linguistic differences between senses of “under” and “in” because they are not encouraged to play with upright cups and more generally because Zapotes use a smaller variety of containers while tending to use them more multi-functionally.

35 Image schemas are specific and recurring action paths formed through time by – usually – embodied experience that act as regularities to orient future experiences.
on habits – community-supported flexible and potentially evolving tendencies – the linguistic use of material symbols does not follow once and for all established conventions, as certain passages of Clark’s articles could lead to think. The meaning of linguistic structures (be it semantic configurations, morphemes, words, idioms, etc.) is flexible and situated. Let us follow once again the Dynamical Systems Theory metaphor. The semantic approach to language can take advantage of this perspective in a more traditional framework that does not take into account the concept of cognitive niche, but is oriented towards a dynamic systems framework: a verbal pattern becomes an attractor for the experiential traces connected to it (cf. Zwaan & Kaschak 2009: 368). “An attractor is a trajectory in phase space towards which all of the trajectories of a non-linear dynamic system are attracted. The meaning of the word [as an attractor] being uttered does not belong simply to the individual but to the community to which the individual belongs [. . . ] and emerges in the context in which it is being used” (Logan 2006: 153). The variability of the context explains that “The attractor is a strange attractor because the meaning of a word never exactly repeats itself for instance because of the variability of the constraints imposed by the medium, the context and the practices at hand. These kinds of dynamics in linguistic and non-linguistic meaning has been increasingly investigated in semiotics: Eco’s Encyclopædia (1975); Rastier’s interpretive semiotics (2001, 2003); Visetti and Cadiot’s theory of semantic forms (2001, 2006); Zlatev’s use potential (1997); the model of meaning potential (Allwood 2003) are examples thereof. In all these cases, the meaning of a situated linguistic structure is defined by an ongoing interaction between sedimented usages (a more normative but pluralistic dimension), co-textual and contextual constraints and expectations. Thus we see the local interaction of different time scales at which meaning is sedimented. Meaning, in this view, must be conceived of as a constraint of the local interaction that is the result of dynamics between the socially established affordances – possibilities of use – of the verbal patterns and the local affordances constructed in the situation.

The whole idea behind interpretive semantics is that sometimes the stability is in the meaning configuration and not in the lexical form (the verbal pattern). Therefore interpretive semantics studies how the forms come into being. This they for instance by dissimilation (Same verbal pattern, different meaning: “there is music and music!”) or assimilation (different verbal patterns, similar semes: “women, fire and dangerous things”). A second important point is the study of how semantic forms propagate (cf. how in “Tristesse de lune” by Baudelaire a forme composed by “roundeur”, “mollesse”, “clartè” keeps propagating through terms like “lune”, “coussins”, “contour de seins”, “dos satiné”, etc.). The idea is to capture how the situatedness of language, together with the relevant norms (genre-related for instance) define a ground on which more or less stable semantic patterns are created and negotiated.
5. Conclusions

Applying a habit-based framework to the articulation between language and cognition, we can thus sketch some conclusions for the role of language in the “external mind”. Clearly, language crosses the external/internal divide in a plurality of ways. While being motivated by embodied experiences and produced/interpreted through cognitive mechanisms largely overlapping with the sensorimotor systems, its being “public” and “external” articulates our most basic and intuitively internal processes to both the continuously evolving complexity and the stability of the social arena.37 On the one hand the public nature of language creates structures that can act as additional foci of attention and - presenting features of abstraction, stability and manipulability – complement non-linguistic cognitive processes, thus widening the experiential field. Remember the functions of language according to Clark and Tylén, which are: to augment memory, to simplify the environment, to coordinate activities through control of attention and resource allocation, to establish control loops, to represent and manipulate data. This functions are achieved in a potentially public therefore intersubjective and social way. Alignment and coordination become increasingly possible both in situation and outside of it – when the subjects are not co-present, when the situation is past or future or just imagined. Socio-cultural normativities are established and constitute a resource and an environment for further cognitive activity. On the other hand this materiality and abstraction is not static and ideal, it is defined through practices with a social horizon and thus it is subjected to evolution and negotiation at the different time scales at which language acts: in local intersubjective communication, in the development of idio- and sociolects, in the more general diachronic linguistic change and in the development of civilization and science. Language is a tool the use of which in many ways transcends and defines the individual through a social and intersubjective horizon that partakes in an historical evolution on different interacting time scales. Language is thus not a conduit for, but a crucial part of cognition, catalytically expanding its social and historical dimension and opening up at a wider scale even the most intuitively private cognitive processes to a more flexible, adaptable and sometimes economical and powerful systemic dimension.38

37 I should like to restate that this does not mean to deny the role of the pre-linguistic and sensorimotor domain – but to articulate and complement it with how it is put to play and partially re-shaped in and through the public arena.

38 Several conceivable consequences can be drawn from these positions: the need to focus on the role played by linguistic structures in their co-text and in the practices through which they are employed, aligned and negotiated, the need to explore the resonance, negotiation and diffusion of linguistic structures, as well as the cognitive consequences of this. More work is in progress on these themes (cf. Tylén and Fusaroli 2010).
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social, cultural material, and sequential structures. of surroundings in which the action occurs. Meanwhile, the body serves as a source of symbols. via bodily language, therefore, conversation is a kind of embodied human interaction. Sacks et al. (1974) proposed the model of turn-taking organization in conversation and verified its possibility and access. Spoken language is an innate ability of the human being and represents the most widespread mode of social communication. The ability to share concepts, intentions and feelings, and also to respond to what others are feeling/saying is crucial during social interactions. Gestures: a Bridge Between Language and Action. One of the major contribution in support of embodied cognition theory derived from the hypothesis of the motor origin of spoken language. Comparative neuroanatomical and neurophysiological studies sustain that F5 area in macaques is cytoarchitectonically comparable to Brodmann area 44 in the human brain (IFG), which is part of Broca’s area (Petrides et al., 2005, 2012). Language is one of the components of culture, which is reflected through culture, but at the same time, language is an independent system. The essence of the social approach is to consider culture separate from nature, from the biological and physiological background, not just relevant to an individual, but relevant to the group of people connected by communication. In this approach, the focus is on the fact that people are not born with a particular culture, but acquire it in the course of communication, on the basis of social activities (V.Osvalt).

Some of the most common symbols are the heart symbol, the dove symbol, the raven symbol, the tree symbol and the owl symbol. Find out what they mean. Edit colors and adjust the size. Use them in your presentations, printables, social graphics and any other type of visual content. Sign up. It's free. 6 Owl. The use of the owl as a symbol is as popular today as it ever was: You see them everywhere, from accessories and clothing to interior design and home décor. But the symbol’s popularity is nothing new. Its historical popularity as a symbol is also due to the fact that an owl always accompanied Athena, the Greek goddess of learning. Connecting symbolic & embodied language understanding. Table 1 presents a structured version of the neural programming language conceptualization. Importantly, this view highlights the important commonalities and differences between ECL and both symbolic programming languages, as well as embodied neural mechanisms, for perception and action. We illustrate these relations more explicitly through a comparison between ECL and executable semantic parsing (Table 1, bottom).