



2 Here comes the semiotic species

Reflections on the semiotic turn in the cognitive sciences¹

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Cognitive semiotics – or, perhaps better, semiotic cognitive science – aims to bring together the knowledge base and models of cognitive science and semiotics. It seems to have been invented several times over, probably because it is needed. What seems to be lacking, most of the time, in semiotics, is real empirical research. What is fundamentally missing in cognitive science is a conception of meaning.

The three ages of cognitive science

It no longer makes sense to invoke “cognitive science” as a whole. Cognitive science can be practised, and indeed has historically been practised, from very different points of view. There is some paradox to the very name “cognitive science”, because its initial aim was to do away with cognition, and indeed consciousness, as we know it. Indeed, the fact that mental life could be simulated on a computer was supposed to show that mental notions could be dispensed with altogether. Consciousness was taken to be no more than a set of calculations based on some snippets of code made by the human brain. Jerry Fodor’s (1987) argument for the “language of thought” is the most explicit version of this point of view. This conception is still very influential within cognitive science in the form of Daniel Dennett’s (1987) idea about the “intentional stance”: that human beings simply work like computers, with the added twist that they, for no useful reason at all, happen to think they are conscious.

In the second age of cognitive science, some researchers realized that human beings (as well as, on some interpretations, some computer programs) could not function outside a human **life world** and without taking their bearings from their outside bodily form. This brings us to the notion of “situatedness”, which has henceforth played an important role in cognitive science, and to the complementary notion of “embodiment”. These notions served to bring ideas from phenomenology and other traditions involved with consciousness into the fold of cognitive science. Before this moment, many phenomenologists and philosophers of consciousness – most famously, Hubert Dreyfus and John Searle – were violently opposed to cognitive science,





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hindering any cross-fertilization. However, both situatedness and embodiment can be given – and have been given – other, more mechanistic, interpretations. The preoccupation with notions such as agency, intentions, consciousness, empathy, intersubjectivity, etc., remains atypical of cognitive science as a whole, though these notions are a major topics within “consciousness studies”, such as practised by Evan Thompson (2007), Shaun Gallagher (2005), Dan Zahavi and a few others. In fact, these notions are anathema to much of cognitive science, both in its classical version and, in a more implicit and confused way, in what may nowadays be described as mainstream cognitive science, associated with the work of Lakoff and Johnson, Dennett, Fodor, etc.²

To Lucy Suchman (1987) and her followers, the term “situated” expressed a need to take context into account. This applies to “embodiment” as well, because our own body is the primary context of all our actions. “Embodiment” is a more precise term than “context”, and perhaps “situatedness” can be defined more precisely too. In any case, even if “situated” and “embodied cognition” are fashionable terms at present, mainstream cognitive science still does not seem to take them in the direction of consciousness studies. The body that forms the context is not the body as lived, that is, as a meaning, but the physical body as studied in neuroscience. Lakoff, Johnson, Rohrer, and their followers today form the core of what is meant by mainstream cognitive science. Although their work is extremely confused and contradictory (as shown most clearly by Haser 2005), and even though it contains superficial references to part of the phenomenological tradition, a close reading of, in particular, their most recent publications shows that in fact they are back at a conception identical in practice to that of classical cognitive science, with the brain substituted for the computer. The body they are talking about is reduced to the neurons and synapses of the brain. Thus, embodiment, in this tradition, is certainly not part of context. This is equally true if their work is interpreted in terms of the kind of influence they have had.

Another related problem derives from the term “cognitive” as such, as it appears in the name of the enterprise. In the traditional discipline of cognitive psychology, and in the psychology of development, as, for instance, in the Piaget tradition, the term “cognitive” has a rather clear, well-circumscribed meaning, being opposed, notably, to perception, unconscious processes, and probably empathy in most senses of the term. At least prototypically, or as a goal state, it involves rational operations, such as those that are characteristic of argumentation or problem solving. Although I am not aware of any explicit definition of the term within cognitive science, it is clear that the term “cognitive” here has taken on a much vaster, fuzzier meaning: originally, it corresponded to everything which could be simulated by a “cognitive device” such as a computer, and nowadays, it appears to stand for anything which can be localized in the brain. According to the “language of thought” hypothesis (first formulated by Fodor), even categorical perception and other elementary perceptual operations are based on cognition. Contemporary representatives





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of cognitive sciences such as Lakoff and Johnson would seem to claim that also thinking, in a more traditional sense, might be reduced to very simple operations, in which case “cognitive science” becomes a misnomer. If the first tradition of cognitive science thus reduced the mind to a computer, and the second tradition held out some hope for an approach to meaning, the third tradition introduced a new kind of reductionism involving the brain.

The kind of cognitive science with which I here would like to organize an encounter is that of the second tradition; that is, the brand whose real epistemological horizon is phenomenology, in its classical Husserlean form as well as in its recent versions within consciousness studies – such as that of Searle, whose version of the philosophy of mind is to a large extent either crypto-phenomenological or a parallel development arriving at the same general conclusions.

Semiotics to the rescue

Like cognitive science, semiotics is often conceived as an interdisciplinary perspective that has occasionally gained the position of an independent discipline – no doubt less often than cognitive science. Curiously, it might be argued that cognitive science and semiotics cover more or less the same domain of knowledge – or rather, they take a very similar perspective on the world. This in itself is controversial, since semiotics and cognitive science offer very different characterizations of their domain (or, strictly speaking, the point of view taken on the domain). In some sense, however, both are concerned with the way in which the world described by the natural sciences appears to human beings and perhaps also to some other animals and robots. Cognitive science puts the emphasis on the place of the appearance of this world, the mental domain (although some of its exponents would not even recognize the mind as such, but would rather talk about the brain and/or the computer), and on its characteristic operation, cognition; and semiotics insists on the transformations that the physical world suffers by being endowed with meaning. Indeed, in an earlier phase, cognitive science seemed more susceptible than semiotics to being described by a simple analogy: the mind as computer.

Semiotics would have nothing to offer cognitive science if it were only a model or a method, or a philosophical standpoint. Elsewhere, I have argued that semiotics cannot be considered a kind of method, a model, a particular philosophical tradition, or even an “interdisciplinary perspective”, whatever that may mean; nor is it simply a critique of ideology or, in Paul Bouissac’s (1999) term, a “meta-analysis”. Semiotics must be taken to be a science in its own right (cf. Sonesson 1992a, 1996, 2004–06). The most obvious reason for this is that semiotics, if it is not erroneously identified with French structuralism, has been using many different models and methods, as well as being practised from different philosophical points of view. Likewise, it is not simply a “meta-analysis” or some other kind of “interdisciplinary perspective”,





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because that does not tell us anything about its originality. It is interdisciplinary and meta-analytical with a twist: semiotics takes meaning as its perspective on the world.

The disciplinary history of these two approaches has been very different. Cognitive science is often described as the result of joining together the knowledge base of rather disparate empirical disciplines such as linguistics, cognitive psychology, philosophy, biology, and computer science. Thus, instead of one research tradition connected through the ages, cognitive science represents a very recent intermingling of several research traditions having developed separately until a few decades ago. Semiotics has, in a more classical way, developed out of the amorphous mass of philosophy, and still has some problems encountering its empirical basis. It might be suggested that the basic concept of semiotics is the *sign*, whereas that of cognitive science is *representation* – even though there is a long tradition in semiotics for rejecting the sign concept, and recent cognitive science has distanced itself from the notion of representation. From the point of view of methods, semiotics is, generally speaking, stuck between the analysis of single “texts” and theory construction, whereas cognitive science is closer to relying on experimental methods (including, of course, computer simulation). These differences may partly explain why semiotics and cognitive science are rarely on speaking terms.

On the other hand, there have recently been some encouraging developments within cognitive science, which, no doubt with some exaggeration, may be qualified as a “semiotic turn”: there has been a recent interest in meaning as such, in particular as it has developed ontogenetically and phylogenetically, in the human species and, to some extent, in other animals and animal-like machines. Terrence Deacon (1997) is a researcher in neuroscience whose work has been particularly acclaimed within cognitive science. Yet he has chosen to express some of his main arguments in a terminology taken from Peirce, who is perhaps the principal cultural hero of semiotics.³ Not only Deacon, but also other scholars interested in the specificity of human nature now put their emphasis on the concept of sign (which they normally term “symbol”, using this word in a sense which we will not employ here). This is true, in a very general sense, of Donald’s (1991) stages of episodic, mimetic, mythic and theoretical culture. It seems to apply even more to Tomasello (1999), less because of his epigraphs taken from classical semioticians such as Peirce and Mead, as well as Bakhtin and Vygotsky, than because of the general thrust of his analysis, which consists in separating true instances of interpreting actions as intentional from those which may merely appear to be such. Building on the aforementioned works, Jordan Zlatev (2002, 2003) is explicitly concerned with the conditions for the emergence of higher levels of meaning involving “mimesis” and language, from more basic ones, characteristic of all biological systems (life forms), such as “cues” and “associations”.

Interestingly, there has also been an attempt at a true “cognitive science turn” in semiotics, most clearly represented by Thomas Daddesio (1995), who





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has, however, not created any true following. Daddesio does try to absorb the empirical knowledge base of cognitive science into semiotics, and seems to side with the consciousness studies strand in cognitive science, at least in some passages, though he mistakes Lakoff and Johnson for its representatives. His main argument for having recourse to cognitive science, however, seems somewhat confused to me: the study of signs and sign systems, privileged by semiotics, has to be complemented by investigations of the ways of having access to these signs, which are more properly studied by cognitive science. It is easy to agree with this, but the physicalist reductionism of behaviourism characteristic of much of American semiotics cannot be put on the same level as the recognition, on the part of the tradition of Saussure, Cassirer, Husserl, the Prague school, and others, that there is also a third level of meaning, the social, intersubjective, one – which does not exclude the mental world, simply because it is a product of the interaction of many mental worlds.⁴ In many other ways, however, Daddesio's contribution has been undeservedly neglected.

Daddesio would thus seem to associate semiotics with a particular philosophical standpoint. But this is a point of view that cannot be sustained. Nor do I think it makes much sense to claim, with Umberto Eco (1988, pp. 323ff), that, on the one hand, there are certain specific semiotic sciences, such as those which study the interpretative habits of events in verbal language, gestures, traffic signs, pictures, and so on; and, on the other hand, there is a general semiotics, which simply postulates the concept of sign, thus permitting us to speak about superficially dissimilar things within a unified framework. Curiously, Eco even claims that the fact of there being different semiotical points of view demonstrates that semiotics is a philosophical activity; but, at the very least, this would show that semiotics is a variety of different philosophical and/or scientific activities. Actually, a more adequate conclusion would be that semiotics – just like sociology, psychology, archaeology, literary history, and so on – can be practised from the point of view of different philosophical conceptions. Thus, there may be a structuralist semiotics, a nominalist semiotics, a phenomenological semiotics, and so on – just as there may be, for instance, a processural and a post-processural archaeology, a positivist and a post-modernist art history, and so on. The kind of semiotics which I believe could permit us to organize an encounter with cognitive science of the consciousness studies brand must be a decidedly phenomenological and empirical semiotics.

In the end, then, what we need, is some kind of meta-analysis: as Bouissac (1999, p. 4) rightly says, we need a procedure which “consists in reading through a large number of specialised scientific publications, selected among the published literature in one or several domains of inquiry, and of relating the partial results within a more encompassing model than the ones that are held by the various specialists concerned”. No doubt cognitive science, by definition, has been better at this than semiotics, because it is characterized by the confluence of various earlier research traditions, whereas semiotics has





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for too long been hampered by the autonomy postulate, taken over from Saussurean and Chomskyan linguistics. For my part, I have always sided with cognitive science in this respect, even before it was invented. What cognitive science needs, however, is to take into account even more research traditions, one of which is no doubt semiotics. However, a meta-analysis that takes a semiotic as well as a cognitive point of view might perhaps better be called cognitive semiotics. In the end, there may be no meaning without cognition, and no cognition without meaning, at least given the wide definition of cognition characteristic of cognitive science. It might perhaps be said that semiotics differs from cognitive science simply by putting the emphasis on meaning rather than cognition.

Specialities such as pictorial semiotics can of course not be reduced to meta-analysis, because, in a fundamental sense, they have to start from zero (even though pictorial semiotics cannot do without perceptual psychology). That much may be conceded to Eco. But even though general semiotics must feature meta-analysis in an essential way, it should not be viewed as simply a tradition within philosophy. As Peirce said, we have to get out of the philosophical soup shops. But some philosophical residue will no doubt be left in the tureen.

The meanings of meaning revisited: the sign

We need the concept of sign not only to understand how semiotic resources such as language, gesture, and pictures differ at present, but also to grasp what happens in evolution and development. The problem is that both Saussurean and Peircean brands of received semiotic theory do not explain *what* a sign is; they simply take it for granted. It is not enough to tell us there are signifiers and signifieds, or representamen, object, and interpretants, without specifying the requirement for something to be one of these. A useful concept of *sign* designates a kind of meaning, but it does not cover all meanings. Perception is clearly meaningful to animals and infants alike, but it seems reasonable to suppose that the capacity for *sign use* is a much more exclusive property. Conceptualizing the capacity of sign use in this way may help us to distinguish stages in evolution and development, an insight that will be explored in the next section.

We will say that the sign is a meaning, which is made up of two parts, traditionally known as *expression* and *content*. That the sign consists of two parts implies that the parts are separated. In Piaget's (1945, 1967a, 1967b, 1970) terms, they are "differentiated from the point of view of the subject". This is not to say that the differentiation is "subjective", in the ordinary language sense – in most cases, the differentiation is part of what is learnt by the child growing into his particular culture. However, what is differentiated within the sign may or may not consist of several objects in the "objective" common sense world (where "objective" is that which is taken for granted in the dealings of ordinary life). Contrary to what Piaget suggests, we will





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therefore conclude that a thing which is immediately continuous to another or which is a part of another in the common-sense world may very well be differentiated within the sign (cf. Sonesson, 1989, 1992b, in press-a). We can imagine this same child that in Piaget's example uses a pebble to stand for a piece of candy having recourse instead to a feather in order to represent a bird, or employing a pebble to stand for a rock, without therefore confusing the part and the whole: then the child would be employing a feature that is *objectively* a part of the bird or the rock, while differentiating the former from the latter *from his point of view*. Only then would he be using a true sign. In terms of socially better-established signs, a similar example would be the bull's head used to indicate, above a market stand, that beef is sold there. Although in France, for example, sculpted heads of bulls or horses are employed outside the relevant shops, it is still possible to find real heads used in traditional markets in some countries. In a parallel fashion, things that are similar to each other can be differentiated within the sign. Thus, there can be indexical (contiguity-based) and iconic (similarity-based), as well as symbolic (rule-based) signs. If I see a branch sticking up over the house and conclude that there is a tree behind the house, this is a mere indexicality; but the marks on the ground left by the animal are indexical signs, clearly separated from the (part of) the animals having produced them. And the photographic print of my wife is clearly differentiated from my wife seen in the picture.

Indeed, a further differentiation may have to be made for certain purposes. The marks on the ground tell me "an elk was here before", and this is something distinct from the marks, as well as from the elk, which is now somewhere else. Similarly, the colour configuration on the photograph is distinct from the perceptual impression of my wife, and the photograph is here with me now, while my wife is at home in Malmö. This is why we really have to separate three parts of the sign, *expression*, *content*, and *referent*, where content is the standpoint taken on the referent by the sign user, as codified in some semiotic resource.⁵ To the hunter, it is important to identify the marks on the ground (expression) as being those of an elk (indexical content), but, being a hunter, he cannot be satisfied with this; he will follow the traces left by the animal until he finds the real elk (referent). Looking at the photography, I have no trouble (unlike small children and animals) in distinguishing the colour spots on the paper (the expression) from the vicarious perception it suggests – for example, my wife 15 years ago dancing the jalsco in an ample, pink skirt (content) – nor from the real person I have known for 26 years and with whom I share so many memories (the referent, the real, continuous person in my personal **life world**).

But differentiation is not a sufficient criterion. Each time we actively and consciously put a set of items that we have perceived together, we must first differentiate the items to be joined – as opposed to the obliteration of their difference in categorical perception. But categorization is not as such a kind of sign use. Contiguity and factoriality are present everywhere in the perceptual world without as yet forming signs: we will say, in that case, that they





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are mere *indexicalities*. An index, then, must be understood as indexicality (an indexical relation or ground) plus the sign function. Analogously, the perception of similarities (which is an iconic ground) will give rise to an icon only when it is combined with the sign function. As always, there are passages in Peirce's work that may be taken in different ways, but it makes more systematic and evolutionary sense to look upon iconicity and indexicality as being only potentials for something being a sign. Iconicity, indexicality, and symbolicity only describe *that which connects two objects*; they do not tell us whether the result is a sign or not (Figure 2.1). These considerations allow us to separate the study of the phylogenetic and ontogenetic emergence of iconicity, indexicality and symbolicity from that of the corresponding signs (cf. Sonesson 1998, 2001, in press-a, in press-b).

The sign as such is thus a whole made up of two parts; therefore, there is necessarily some relationship between these parts. There is a *double asymmetric relationship* between expression and content. First, from the point of view of immediacy, expression is more accessible to consciousness than content. In the second place, content is more in focus (more prominent, more important) than expression. When I look at the photograph, I am normally interested in the person depicted (my wife, either at the exact moment she was dancing the jalisco, or as an enduring person of my personal **life world**). My wife does not represent the photograph.⁶ The phenomenologist Edmund Husserl (1939) formulated the definition of the sign (more precisely, "appresentation") more or less in these terms, but a similar view is implicit already in Augustine's conception of the sign (in our terms, the expression) as something which, by becoming conscious, makes us aware of something else (the content; cf. Deely, 2001). This does not preclude other relations between expression and content being symmetric. It is common to suppose a substitutive relationship, which is a symmetric relation, between expression and content, but this may be misleading, since expressions are rarely used for the same purpose and in the same context as their contents.

However, Bates (1979, p. 43) has hinted at the idea that the sign (our expression) and its referent (which would seem to correspond to both what I

	Firstness	Secondness	Thirdness
Principle	Iconicity	—	—
Ground	Iconic ground	Indexicality = indexical ground	Symbolicity = symbolic ground
Sign	Iconic sign (icon)	Indexical sign (index)	(Symbolicity = symbolic ground =) symbolic sign (symbol)

Figure 2.1 The relationship between principles, grounds, and signs, from the point of view of Peirce (adding a thirdness of ground from Sonesson's point of view).





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have called content and referent) must be conceived as being both similar and yet separate for a sign relationship to obtain. Bates' somewhat convoluted definition is later unpacked by Daddesio (1995, p. 117):

Given a physical mark (sound, movement, shape, etc.), *a*, and a particular class of things, *b*, that *a* is thought to stand for, let us consider three possible ways in which the organism can relate *a* and *b*. In the first instance, the organism fails to grasp any relation whatsoever between the two. . . . In the first case, semiosis is thus absent. In the second case, the organism would be capable of relating the two, but instead of apprehending a relation between two distinct entities, it would simply react in the same fashion if presented *a* and if presented *b*. . . . In the third case, the organism would recognize *a* and *b* as distinct but related.

As we will see later, it is in fact impossible to conclude, from an individual treating *a* and *b* as being distinct, that the particular relationship between *a* and *b* is necessarily one of appresentation (sign function). Daddesio's second case is that of categorization, which is important to perception. Given a prototype conception of categories, *a* and *b* may be treated as different just because they are differently central to the category of which they are perceived to be a part. Or they may be attended to differently, merely because one contains more, and more interesting, perceptual properties than the other (and, indeed, sign vehicles would tend to be "degraded stimuli" when compared to what they are signs of). The problem of separating the expression and the content of a sign becomes particularly acute in the case of an iconical sign, in which, by definition, expression and content must share at least some properties.

The sign, then, consists of two intrinsic parts, expression and content, which are related to a third, the referent. The relation between these parts may be iconic, indexical, or symbolic, but it always supposes a differentiation of the parts, from the point of view of the sign user. The sign relation is asymmetric in a double sense: what we call expression is always more directly perceived than the content, and the content is more accessible than the referent. On the other hand, it is the referent and/or the content which is in focus, at least more so than the expression.

The evolution of semiotic resources

The semiotic function, as defined by Piaget, is the capacity acquired by the child at the age of around 18 to 24 months that enables him or her to imitate something or somebody outside the direct presence of the model, use language, make drawings, play "symbolically", and have access to mental imagery and memory. The common factor underlying all these phenomena, according to Piaget, is the ability to represent reality by means of a signifier, which is distinct from the signified. In several of the passages in which he makes use of





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this notion of semiotic function, Piaget goes on to point out that “indices” and “signals” (which, in our terms, are only indexicalities) are possible long before the age of 18 months, but only because they do not suppose any differentiation between expression and content. The sign function thus characterizes a stage of child development, though Piaget himself chooses to describe this stage only negatively.

Contemporary studies of evolution suggest that not only human language, but also the capacity to use pictures, as well as many kinds of mimetic acts and indices, is (at least in its full, spontaneously developed form) uniquely human. It is clear that semiosis itself must be manifold and hierarchically structured, in ways not yet dreamt of in our philosophy. Merlin Donald (1991, 2001) has proposed an evolutionary scale, where the stages of episodic, mimetic, mythic and theoretic culture correspond to types of memory (Figure 2.2). According to this conception, many mammals, which otherwise live in the immediate present, are already capable of *episodic* memory, which amounts to the representation of events in terms of their moment and place of occurrence. The first transition, which antedates language and remains intact at its loss (and which Donald identifies with *Homo erectus* and wants to reserve to human beings alone) brings about *mimetic* memory, which corresponds to such abilities as tool use, miming, imitation, coordinated hunting, a complex social structure and simple rituals.

Only the second transition brings about language (which, Donald muses, may at first have been gestural) with its *semantic* memory; that is, a repertory of units, which can be combined. This kind of memory permits the creation of narratives; that is, mythologies, and thus a completely new way of representing reality. Interestingly, Donald does not think development stops there, even though there are no more biological differences between human beings and other animals to take account of (however, the third transition obviously would not have been possible without the attainment of the three earlier stages). What Donald calls *theoretical* culture supposes the existence of external memory; that is, devices permitting the conservation and communication

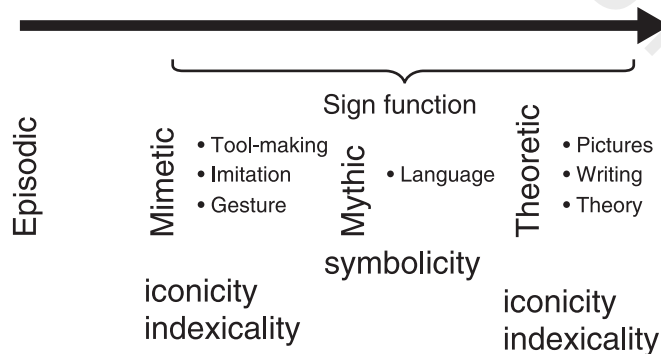


Figure 2.2 Donald's model of evolution related to the notion of sign function.





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of knowledge independently of human beings. The first apparition of theoretical culture coincides with the invention of drawing. For the first time, knowledge may be stored externally to the organism. The bias having been shifted to visual perception, language is next transferred to writing. It is this possibility of conserving information externally to the organism that later gives rise to science.

The diverse manifestations of Donald's second stage (mime, skill, imitation and gesture) are, in my view, iconic (at least in part; based on similarity) – but for the most part they are *tokens* conforming to a *type* – members of a category – not yet signs. Somewhere between mimesis and language, the semiotic function arises (though Donald notes this only obliquely, mentioning the use of intentional systems of communication and the distinction of the referent). In fact, this certainly happens between animal camouflage and pictures. Yet, according to Deacon (1997, pp. 74ff), iconicity as found in “a portrait” is “not basically different” from the fact of there being no distinction at all, it would seem, from mere identity. On the following pages, Deacon goes on to maintain that a number of phenomena that could otherwise appear to be completely different are in fact equivalent: the perception of the same “stuff” over and over again (seeing something that does not change into something else), camouflage as exemplified by the case of the moth's wings being seen by the bird as “just more tree”, “stimulus generalization”, and even recognition; that is, the identification of something as pertaining to the same category. This may be true at some level, but it is not useful for determining either the systematic or the developmental properties of different semiotic resources. Although all or most abilities subsumed under the mimetic stage depend on iconic relations, only some of them are signs, because they do not all involve some asymmetric relation between an expression and the content for which it stands.

Meaning as conceived in biosemiotics

The semiotic function, in Piaget's sense, must be contrasted with the biosemiotic concept of meaning, epitomized by the world of the tick, or, equivalently, by the same landscape as seen by a human being, a fly, a mollusc, or a dog, as illustrated in von Uexküll's (1956) pictures. This is meaning as a category, as a filter applied to the world: it consists in picking out some properties and ignoring others. When incorporated into the sign concept, this filtering device becomes relevance: the difference between the *theme* and the *background*. Relevance implies the possibility of going from one *Umwelt* to another but also of redefining the *Umwelt* – which the tick cannot do. Relevance is just as possible in pictures as in language.

From a Peircean point of view, Deacon is quite right in searching for a “basic sense” of iconicity beyond “the way we typically use the term”, but what he comes up with is both too much and too little. Deacon suggests that iconicity is the fact of there being no distinction: the perception of the same





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“stuff” over and over again. It is, he maintains, like camouflage: the moth’s wings being seen by the bird as “just more tree”. He goes on to suggest that iconicity is recognition; that is, the identification of a category, and even “stimulus generalisation”. Then he claims that “typical cases”, such as pictures, are essentially of the same kind: what makes pictures into icons is “the facet or stage that is the same for a sketch and the face it portrays”.

Peircean iconicity, which is not yet a sign, may well correspond to what is known in psychology as “categorical perception”; that is, the perception of something as being identical as long as it appears between a lower and a higher threshold of some property subject to variation. According to the biosemiotic model, pioneered by von Uexküll, all objects emitting butyric acid are identical to the tick. Thus, camouflage, to the extent that it is never discovered to be camouflage, the stem, to the extent that its identity is not the product of an act of comparison, and stimulus generalization, as long as it never becomes conscious as such, could be seen as simple iconicities; that is, repertoires of properties, not signs.

Recognition, however, must already be an iconic ground. In one of his well-known definitions of the sign, a term which he here, as so often, uses to mean the sign-vehicle, Peirce (1931–58, 2:228)⁷ describes it as something which “stands for that object not in all respects, but *in reference to a sort of idea*, which I have sometimes called the ground of the representamen” (my italics). While some commentators have claimed that Peirce is here talking about some properties of the expression, and others favour the content, the ground must really concern the relation between them. Such an interpretation seems to be borne out by Peirce’s claim that the concept of “ground” is indispensable, “because we cannot comprehend an agreement of two things, except as an agreement in some respect” (I.551). In another passage, Peirce (I.293) himself identifies “ground” with “abstraction”, exemplifying it by the blackness of two black things. It therefore seems that the term “ground” must stand for those properties of the two things entering into the sign function by means of which they get connected; that is, both some properties of the thing serving as expression and some properties of the thing serving as content.⁸ In the case of the weathercock, for instance, which serves to indicate the direction of the wind, the content ground merely consists in this direction, to the exclusion of all other properties of the wind, and its expression ground is only those properties which make it turn in the direction of the wind, not, for instance, the fact of its being made of iron and resembling a cock (the latter is a property by means of which it enters an iconic ground, different from the indexical ground making it signify the wind). If so, the ground is really a principle of relevance, or, as a Saussurean would say, the “form” connecting expression and content: that which must necessarily be present in the expression for it to be related to a particular content rather than another, and vice versa. Iconicity and indexicality are already, as such, systems of mapping between different objects. The sign function is a system of mapping that is independent of the former (cf. Figure 2.3. and Sonesson, 1989, Part III, Chapter 1).





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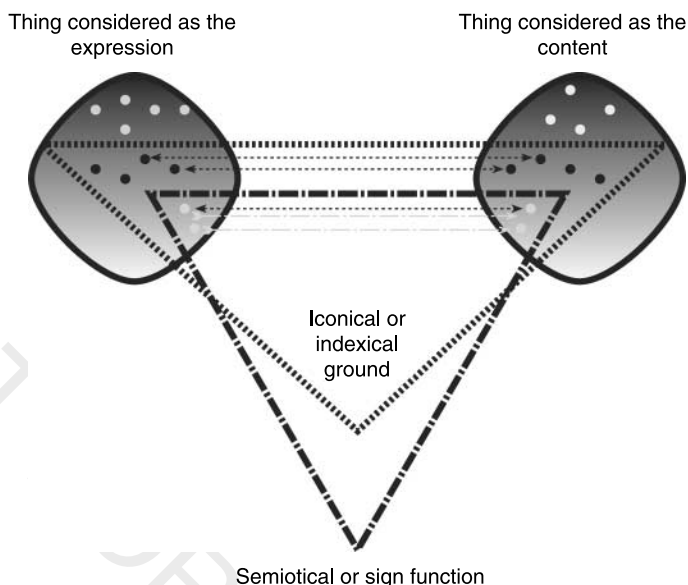


Figure 2.3 The sign as a mapping between different spaces, based on different principles of relevance.

To see camouflage *as* camouflage is of course to deprive it of its functionality: it is not meant to be discovered as such. The capacity for doing so is useful for the biologist, as it is of course for the potential victims or predators of the animal using the camouflage – but not so for the camouflaging animal. The case of the picture is the opposite. It only functions as a picture when it is seen *as* a picture. This is what is meant by the picture being a sign. It is not a stand-in for that which it represents: like verbal language, it is a way of making the absent thing present as seen from a particular point of view; that is, thematically adumbrated.

The place of the picture in evolution

In the view of James Gibson (1978), normal perception gives *direct* access to reality; in contrast, pictures represent a kind of indirect perception (cf. Sonesson, 1989, Part III, Chapter 3, p. 6). The perception of surfaces, of their layout, and of the transformations to which the latter are subjected, is essential to the life of all animal species, Gibson maintains, but the markings on these surfaces have only gained importance to man, notably in the form of pictures. Surfaces have the kind of meaning which Gibson (1978, p. 229, 1980, p. xii) elsewhere calls “affordances”; the markings on surfaces, however, have “referential meaning”. Markings of surfaces, which have referential meaning, would seem to presuppose the kind of organism-independent artefacts which emerge with the final, “theoretic” stage of Donald’s evolutionary story.





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Although Gibson does not use the term, he clearly implies that the picture is a sign, in the sense of being as a surface, which, on being perceived, brings something beside itself into awareness. If Gibson means to suggest that surfaces can never be taken to be something else than surfaces by animals and children, he is clearly wrong. Many animals have been shown to recognize something in a picture that they have only seen in real life, or vice versa (cf. Fagot, 2000). This, of course, can be explained by simple category perception – iconicity, not iconic signs.

Both a similarity and a difference between the picture and depicted object are required. But even this is not enough. Children as young as 5 months old look longer at a doll than at its picture (DeLoache & Burns, 1994). Doves have also been known to react differently to a picture and its referent (Cabe, 1980). This shows that the picture and its object are seen as different, but not necessarily as a sign and its referent. There may be various other differences; for instance, one may speculate that the real doll is seen as a more prototypical instance of the category; or, it may be more interesting because of having more perceptual predicates. Real understanding of the picture sign certainly seems excluded: 9-month-olds, but not 18-month-olds, will try to grasp the object depicted (DeLoache, 2004). Grown monkeys and even gorillas try to eat the picture (or, rather, what it shows), but not, interestingly, chimpanzees.⁹

The difficulty consists in seeing, at the same time, both the surface and the thing depicted. In other words, it consists in making a *differentiation*. But there is also the difficulty of understanding which item of the pair is the surface and which is the real thing – that is, of grasping the *asymmetry* of the sign relation. To interpret pictures appears to be surprisingly difficult: experiments by DeLoache and her collaborations (e.g. DeLoache & Burns, 1994) suggest that the picture is understood later than language (around 2½ years). The problem may be that iconicity gets in the way of the sign function. This is consistent with another finding of DeLoache, according to which scale models are even more difficult to understand. However, the task set by DeLoache appears to involve more than the recognition of the picture as a picture – it requires an action: to fetch the hidden object. On the other hand, the verbal scaffolding used seems to render the task easier. Without verbal scaffolding, pictures are understood even later, according to Callaghan (Callaghan & Rankin, 2002). To this should be added various kinds of indexical scaffolding used by DeLoache, involving pointing as well as creating neighbourhood relations between the picture and the depicted object. However, it is interesting to discover that children that are unable to retrieve the real object in the room corresponding to the picture have no problem identifying it from one picture to another.¹⁰ The problem then would be finding the referent, not the content. It consists in going beyond the system of signs to the **life world**.





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Imitation on the way to signs

Imitation, or, more exactly, “representative imitation”, is claimed by Piaget (1945) to be at the origin of the semiotic function. Merlin Donald places imitation within the second stage of human development, mimesis. In his view, mimetic culture starts with the emergence of “conscious, self-initiated, representational acts, which are intentional [i.e. voluntary] but not linguistic” (1991, p. 168). The examples given by Donald are such things as gesture, dance, ritual, mime, play-acting, and (precise) imitation, but also tool use (or perhaps rather the social generalization of tool use) and skill.

In fact, in his early book, Donald (1991, p. 168f) opposes mimesis to mimicry and imitation, both of which are said to be quite common in animals but lacking “a representational dimension”. Though the import of this claim is not clear, it could be taken to mean that mimicry and imitation, in this sense, lack differentiation. In Donald’s (2001, pp. 260f) later book, however, “(precise) imitation” is an instance of mimesis. This would no doubt exclude the kind of automatic imitation in the infant (“neonatal mirroring”), discovered by Meltzoff, such as sticking out the tongue to one who does just that (cf. Gallagher, 2005; also see Donald, 2001, pp. 264ff; Sonesson, in press-a). It is less clear whether Donald would follow Tomasello (1999) in making a distinction between the imitation of goals (called “emulation”), of which he believes apes to be capable, and the imitation of means, which is a capacity Tomasello would like to restrict to human beings, although he later (in Tomasello *et al.*, 2005) recognizes its presence in at least some apes.¹¹ At first it may seem strange that imitating the goal is presented as being easier than imitating the means by which the goal is achieved. But no doubt it is less demanding to recognize the interest of the aim (getting the banana) than the interest of the requisite steps for realizing the goal. At another level, it is like attending to the content, not the expression, of a sign. Indeed, it is an instance of quite ordinary **life world** behaviour.

One may wonder why tool use and skill are thought to be part of mimetic culture, and not just “routine locomotor acts” or “procedural memory”, which Donald (1991, p. 168) elsewhere takes pains to separate from mimesis. No doubt Donald (1991, pp. 171ff) would answer that they are different because they comply with his criteria for mimetic acts: they are “intentional” (that is, voluntary), “generative” (that is, analysable into components that may be recombined into new wholes), and “communicative” (or at least, as we shall see, “public”). Moreover, they have reference (“in mimesis the referential act must be distinguished from its referent”; that is, in our terms, there must be differentiation), stand for an unlimited number of objects, and are autocued (produced without an external stimulus, therefore being the earliest form of “thinking”). Generativity is a property of many kinds of meaning that are not signs. However, it is not clear in what sense tool use and many other kinds of skill are “communicative”, and, therefore, in which way they have reference and stand for an unlimited number of objects.





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However, after introducing “communicativity” as a criterion of mimesis, Donald (1991, p. 172) goes on to say that “although mimesis may not have originated as a means of communication, and might have originated in a different means of reproductive memory, such as tool-making, mimetic acts by their nature are usually public and inherently possess the potential to communicate.” This, though, is very different from imitation as a sign, which is what is realized by the actor, who presents his acts to a specific public; it is even different from the child’s symbolic play, which must be available to and shared with other children. What we have here is, first, the extraction of a token from a type, which supposes treating the other as a spectacle; and second, the realization of the tool act, which is not public-directed, but can be made available to the public (Figure 2.4). The use of the tool does require the separation of the typical properties from the single act occurring in the here and now. In order to learn the use of a tool, one must at least be able to isolate the properties that should be imitated from those which are of no avail. However, even though this act of imitation may be observed, it is not part of its purpose to be observed. When the actor who has the part of Hamlet lifts up the skull of “poor Yorick”, then his act does not only consist in imitating what a man having that name supposedly did in Renaissance Denmark, but also in presenting this act as

	Play-acting (expression/ content)	Symbolic play (expression/ content)	Tool use (Token/Type)	Imitation as learning (extracting type from token)
Vehicle	Creating the appearance here and now of being Hamlet doing Hamlet things	Realizing the typical acts of the mother part	Using the typical means for realizing the type hammering the nail	Observing the hammering (first token) extracting the type for doing hammering (second token)
Tenor	Doing as Hamlet did in Elsinore during the Renaissance	Doing what mothers usually do to their babies	Doing the type of act having as goal to hammer a nail	Extracting the type of hammering a nail
Relation tenor /vehicle	Individual act in time and space sign for individual act in time and space	Individual act sign for habitual act	Token that instantiates a type	Using a token – or several tokens – to extract a type
Relation to public	Asymmetric and enduring	Symmetric and intermittent	Possibly available to the public but not public-directed	Available to the public but not public-directed

Figure 2.4 Some different meanings of imitation.





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something to be seen, as a spectacular act, an act that is meant to be seen (cf. Sonesson, 2000). The symbolic play of children may perhaps be considered to be some kind of intermediary case, because its spectacular character is instrumental in making the play function as play, but it is not intentionally offered as a spectacle for individuals not participating in the play.

Thus, tool use and other kinds of skill as such are not mimesis, because they are not communicative, but they are “public”, and they lend themselves to imitation – which leads to generalization of tool use and skill in society. This is where they become different from routine acts and procedural memory. They are socially shared. But this is only possible if the act can be separated from the unique tool user and transferred to another user. That is, the act as token must be abstracted to a type in order to be realized in another token. What is shared is the type, in other words, the scheme of interpretation, which defines the principle of relevance (in the sense, characterized above, of a rule that picks out the properties of one object being mapped onto another). In this sense (not in the sense of reference), a single mimetic act may correspond to various events.

It is therefore by means of imitation that the “extension of conscious control into the domain of action” (Donald, 2001, p. 261) may be obtained. But the act of imitation is in no way a sign. If I see somebody use a stone as a tool to crack open the shell of a nut, I may do the same thing, not to bring to mind the act of the other person I have observed, but to obtain the same effect. I attempt to realize the same act that he did; that is, to open the shell so that I can take out the Kernel and eat it. Instead of producing an expression that is non-thematic but directly given which refers to a content that is thematic but indirectly given, I am realizing a new instance of the category of acts consisting in cracking open a nutshell. Like Tomasello’s apes, I may of course try to obtain the same effect without attending to the adequate means, which would produce a failed act of imitation. Or, I may merely simulate the outer actions of cracking the shell open, without letting them have a sufficient impact on the physical environment, in which case I may be engaged in symbolic play, play-acting, or simply practising the movements.

Imitation may thus be said to be differentiated, in the sense of separating the mediator and that which is mediated, but it is not asymmetric, either in the sense of focus, or in that of directness. Indeed, it is really the type that is mediated by the token. This also means that the purpose of the act of imitation is not to present the original act to another subject (or even to oneself). In fact, Bentele (1984) argued against Piaget that imitation does not manifest the semiotic function, but is a prerequisite for it: indeed, it will function as a sign only to the extent that it is taken to refer back to the imitated act, instead of just being another instance of the same kind. Moreover, the toy is a sign, Bentele claims, only to the extent that the child takes it to represent the real thing, and this cannot be true, for instance, in the case of a toy lion if the child has no experience of the real animal. In fact, the extent of the knowledge of the child may not be the relevant factor, but rather the attitude





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taken by the child: according to the degree of the fictionality of the play world, that is, its separateness from the real world, that is grasped by the child (cf. Winner, 1982), the lion may be made to instantiate a real lion or to present it to the other children.

Acts of imitation in this sense have two interesting properties: they are “public”, in the very broad sense characterized by Donald – that is, they may be perceptually, often visually, inspected – and they can be copied by means of the observer’s own body, with or without some additional implement such as a stone. In both these ways, imitation is different from episodic memory; and it is different from procedural memory in being a public record. As in procedural memory, the record is located in one’s own body, but it can only function as memory to the extent that it is somehow separable from the body as such. While being in the body, it is not of the body. In fact, this can only be so, to the extent that some memory traces are instantiated in other bodies as well as in one’s own body. This supposes a distinction between token and type (that is, relevance) preceding that of the semiotic function.

Conclusions

To describe humankind as the symbolic species, if the term is taken in its Peircean sense, has the unfortunate effect of reducing the human speciality to merely conventional signs, and this often, as in the work of Deacon, amounts to a reduction to language. Instead, I have suggested that human beings are special in mastering a number of signs as well as other semiotic resources embedded already in perception, which is not differentiated, but which may still be iconic, indexical, or symbolic. Mimesis, which is (often) iconical, serves as mediation between meaning and signs. It is in this sense that I have presented you to the semiotic species.

Notes

- 1 Some of the ideas presented in this article were either preconditions for, or results of, the EU project Stages in the Evolution and Development of Sign Use (SEDSU), with which I have been involved for the last three years.
- 2 My first tradition seems to correspond to what Thompson (2007, pp. 4ff) calls cognitivism, but the other two only overlap somewhat with Thompson’s “connectionism” and “embodied dynamicism”.
- 3 Without trying in any way to diminish Deacon’s contribution – in fact, I find him very convincing whenever he is not having recourse to semiotic terminology – I have earlier expressed serious misgivings about his way of using Peircean terms, because this serves to obscure both the central issues of semiotics, and those introduced by Deacon (cf. Sonesson, 2006).
- 4 I am of course simplifying the issue: thus, there is a notable ambiguity in the work of Saussure between a social and an outright formalist interpretation.
- 5 This is of course not the Peircean triad, but rather corresponds to the representamen, and to the immediate and dynamic objects, respectively (as well as to the corresponding interpretants).





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- 6 Seeing her now, I may of course be reminded of when I took that photograph, or when she made did dance, but this does not change the asymmetric structure of the sign, but only my mental use of it.
- 7 As is customary in all research referring to Peirce, I use here and in the following citations this format to indicate the volume and paragraph of the *Collected Papers*.
- 8 In fact, at least in certain passages, Peirce (1998, vol. I, pp. 1–10) would seem to reserve the term “ground” for the portion of the expression singled out and the term “correlate” for the corresponding part of the content, but this leaves the important relation between the pair unaccounted for (cf. Sonesson, in press-a).
- 9 According to findings of the SEDSU project, with which I am presently involved.
- 10 According to a forthcoming study by my student Sara Lenninger in the SGB project.
- 11 A study of imitation of actions from static pictures, in which I was involved in the SEDSU project, would certainly seem to suggest that apes may be capable of imitating means as well as goals, at least in one sense of these terms.

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