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ORIGINS OF PICTURES

KLAUS SACHS-HOMBACH / JÖRG R. J. SCHIRRA (EDS.)

HERBERT VON HALEM VERLAG

ANTHROPOLOGICAL DISCOURSES IN
IMAGE SCIENCE

Klaus Sachs-Hombach / Jörg R. J. Schirra (Eds.)

Origins of Pictures

Anthropological Discourses
in Image Science

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CONTENTS

| | |
|--|-----|
| KLAUS SACHS-HOMBACH / JÖRG R. J. SCHIRRA | 9 |
| Introduction | |
| | |
| I. METHODOLOGICAL ASPECTS OF PICTURE ANTHROPOLOGY | |
| | |
| IAIN DAVIDSON | 16 |
| Origins of Pictures: An Argument for Transformation of Signs | |
| | |
| JEAN CLOTTE | 47 |
| Consequences of the Discovery and Study of the Chauvet Cave | |
| | |
| LAMBROS MALAFOURIS | 73 |
| Learning to See: Enactive Discovery and the Prehistory of Pictorial Skill | |
| | |
| CHRISTA SÜTTERLIN | 90 |
| Early Face Representation as Proto- or Archetype of Generalized Human Face Perception | |
| | |
| II. RELATION BETWEEN EMPIRICAL ANTHROPOLOGICAL INVESTIGATIONS AND SYNTHETIC PHILOSOPHICAL INVESTIGATIONS | |
| | |
| SØREN KJØRUP | 110 |
| Resemblance Reconsidered: Confessions and Concessions of a Conventionalist | |
| | |
| JÖRG R. J. SCHIRRA / KLAUS SACHS-HOMBACH | 132 |
| The Anthropological Function of Pictures | |

III. ARCHEOLOGICAL AND PALEOANTHROPOLOGICAL PERSPECTIVES ON THE »FIRST« PICTURES

CHRISTIAN ZÜCHNER 160
Symbols and Signs of the Earliest Art of Ancient Europe

NICHOLAS J. CONARD / HARALD FLOSS 172
Early Figurative Art and Musical Instruments From the
Swabian Jura of Southwestern Germany and Their Implications
for Human Evolution

EKKEHART MALOTKI 201
The Road to Iconicity in the Paleoart of the American West

ELLEN DISSANAYAKE 230
Born to Artify: The Universal Origin of Picturing

TILMAN LENSSEN-ERZ 250
The Dark Ages of Picturing: Does Art Originate from Caves?
A Synopsis

IV. PICTURE COMPETENCE IN DEVELOPMENTAL PSYCHOLOGY AND THE ROLE OF GESTURES AND FACIAL EXPRESSIONS

GÖRAN SONESSON 270
The Picture Between Mirror and Mind: From Phenomenology
to Empirical Studies in Pictorial Semiotics

JOHN MATTHEWS 311
Seven Spots and a Squiggle:
The Prehistory of Pictures

DIETER MAURER 353
Early Pictures in Ontogeny and Phylogeny:
Preliminaries to a Comparison

SABINE VÖLKELE / PETER OHLER 378
Understanding Pictures in Early Childhood

V. CULTURAL ANTHROPOLOGY:
ON THE ORIGINS OF PICTURES AND
PICTURE-FREE SOCIETIES

DEREK HODGSON 401
Ambiguity, Perception, and the First Representations

JOACHIM KNAPE 424
Image Textuality, Narrativity, and Pathos Formula:
Reflections on the Rhetoric of the Image

PHILIPP STOELLGER 460
The Image – As Strong as Death?
On Death as the Origin of the Image

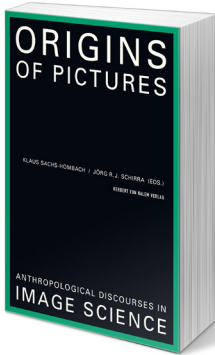
HELGE GERNDT 490
When Do Images Emerge?
Religious Image Practices in the Late Middle Ages

HANS DIETER HUBER 506
Images of the Dead

EKKEHARD JÜRGENS 521
Pictures – What For?
Seven Hypotheses on the Origin of Art

The Authors 551

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Anyone talking about pictures by necessity refers to those using pictures. It is therefore essentially the competence of using pictures that has to be considered. Such competence is not common among higher developed mammals, at least as far as we know today. This fact raises the question whether and to what extent that ability has to be conceived as a strictly anthropological one. In an interdisciplinary approach, the first international conference of the Society for Interdisciplinary Image Science (GiB) titled *Origins of Pictures* has taken a closer look at the role of pictures for the *conditio humana*.

The primary goal of the conference was to present empirical findings of the origins of picture uses, considering in particular research in paleo-anthropology, archeology, cultural anthropology, and developmental psychology. Furthermore, those findings were to be related to philosophical considerations concerning the conditions of the conceptual formation of picture competence.



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IV. PICTURE COMPETENCE IN DEVELOPMENTAL PSYCHOLOGY
AND THE ROLE OF GESTURES AND FACIAL EXPRESSIONS

GÖRAN SONESSON

The Picture Between Mirror and Mind:
From Phenomenology to Empirical Studies
in Pictorial Semiotics

Cognitive semiotics is a label having been used repeatedly in recent decades for the attempt to integrate the stock of knowledge, the theories and the methods existing in cognitive science and semiotics, with the long-term ambition of unifying the human and social sciences and bringing them into relation with biology (cf. SONESSON 2007a, 2007b, 2009a, 2009b). In the particular case of the study of pictures, this means articulating ideas from the psychology of perception, philosophy, and structuralist semiotics, more concretely the theories of picture perception first outlined by James Gibson and others, the phenomenology of Edmund Husserl, and the pictorial semiotics of Jean-Marie Floch, Groupe μ , and others. Such an attempt was initiated many years ago by this author (SONESSON 1989). But another task remains to be accomplished: to bring the experimental study of child development as well as of primate behaviour (standing in for the behaviour of early *Homo sapiens*) with reference to pictures to bear on what we know about pictures from semiotics and other theoretical approaches.

Psychological experiments have rarely been used within pictorial semiotics, with the notable exceptions of the work by Lindekens (1976) and Krampen (1983), which does hardly pertain to developmental issues. Nevertheless experimental studies are no doubt particularly apt to elucidate the fundamental questions of semiotics, in particular in relation to the evolution and development of signs and other meanings. In recent decades, a number of psychologists have addressed semiotic topics with the help of experiments. Two groups have made important contributions to the field:

on the one hand, Judy DeLoache and her collaborators, who study, notably, the capacity of children for understanding how to retrieve a hidden object which is shown in a picture or a scale model (DELOACHE 2000; BURNS 1994), a set-up which was later replicated with apes (KUHLMIEIER/BOYSEN 2002); on the other hand, the work accomplished by Michael Tomasello (1999, 2008) and collaborators, which is dedicated to the emergence of meaning in both children and apes on a much wider scale. From the point of view of semioticians, of whichever conviction, the terminology in these studies seems seriously misleading, and the concepts offered for study appear to be insufficiently analysed. But these are no doubt the pioneering contributions to experimental semiotics. An explicitly semiotical framework combined with experimental studies has so far been used only by Persson (2008), Lenninger (2009), and by this author in collaboration with some Leipzig primatologists (HRIBAR/CALL/SONESSON in press) as well as with his group at Lund University (e.g. ZLATEV et al. in press).

In this article, I will begin by pondering which semiotical considerations may be of relevance for experimental work, starting, as always, by grounding both theory and practise in phenomenological reflection (cf. SONESSON 2009a, 2011). I will then review some of the extant studies, mostly developed from the point of view of psychology, contemplating at the same time in what way such experimental studies might be modified applying the standpoint of a phenomenologically steeped semiotic theory.

1. Phenomenological considerations on semiosis

Taking my cue from a schema for the evolution of human specificity, suggested by Merlin Donald, I will examine the emergence of semiosis, in the general sense of meaning-making, and will then go on to scrutinize a peculiar type of semiosis, the sign, concentrating afterwards on one of its subcategories, the picture. To show that the sign is a particular kind of semiosis, and not all the kind there is, and that the picture is of this specific kind, we have to engage in phenomenological analysis. Following Husserl's lead, I will take phenomenology to be basically a kind of free variation in the imagination (ideation), which allows us to pinpoint the limits between categories. The notion of the sign, as well as that of the picture, will be derived in this way.

1.1 *Evolutionary beginnings*

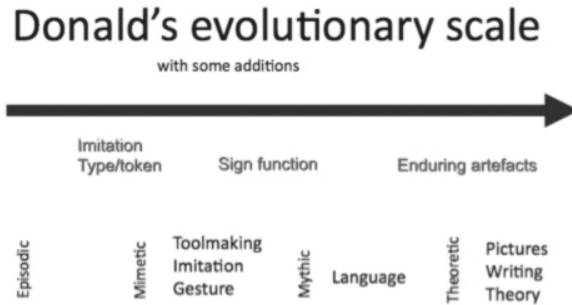
Contemporary studies of evolution suggest that not only human language but also the capacity for using pictures, as well as many kinds of mimetic acts and indices, are (at least in their full, spontaneously developed form) uniquely human. It is clear that semiosis itself must be manifold and hierarchically structured, in ways not yet dreamt of in our philosophy. In order to grasp some of the discontinuities between human beings and other animals, it is useful to start out from the conception of phylogeny proposed by Merlin Donald (1991, 2001), which may be supposed to have at least some rough parallels in ontogeny, as suggested by Katharine Nelson (2007) and Jordan Zlatev (2007).

In Donald's evolutionary scale, stages of episodic, mimetic, mythic and theoretic culture correspond to types of memory (Fig. 1.). 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 for human beings alone), brings about *mimetic* memory, which corresponds to such abilities as tool use, miming, imitation, co-ordinated hunting, a complex social structure and simple rituals. Without even taking into account intricate phenomena such as social structure, ritual, and hunting, one cannot avoid observing the heterogeneity of this list: in some cases, such as most clearly tool use and some instances of imitation, no sign structure, with a clear distinction of expression and content, is required, but simply the conformity of tokens to a remembered *type*, but in other cases, exemplified by other instances of imitation, and by miming and other gestures, the sign function would seem an absolute prerequisite. If early mimesis may give rise to the organization of tokens into types, the sign would seem to emerge at the later mimetic stage.

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. Although Donald is not very clear about it, his description of semantic memory could be taken to imply the presence of system character, that is, an organization in which signs define each other

FIGURE 1

Donald's model of evolution related to some further discontinuities: type/token, the sign, system character, and organism-independent (or enduring) artefacts



mutually. It is quite conceivable for language (but perhaps in an earlier gestural form) to be the first extant sign system.

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.¹ What Donald calls *theoretical* culture supposes the existence of external memory, that is, devices permitting the conservation and communication 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. This, again, would seem to be a breaking point on the way to human beings: the possibility of memory as an external record, which perdures independently of the human organism.

It is not clear, however, why Donald places the picture at this late stage of development. Many pictures may have been made in prehistory, well before the occurrence of language, but have perhaps not been preserved, because they were made in a less durable material. They could, for instance,

1 On the other hand, the third transition obviously would not have been possible without the attainment of the three earlier stages.

have taken the form of skin painting. Indeed, more recent cultures, such as the Tibetan one, are known to make pictures in the sand, according to predetermined patterns, which are then destroyed and created again, following the same pattern, at some other place. They would not then be (very) durable artefacts and could well have been current during the mimetic stage. Since they could be said to consist of manual behaviours that are repeated, they are in a sense similar to gestures.² On the other hand, students of child development have given quite different arguments for pictures emerging later than language (see 11.1 below).

Elsewhere, I have used Donald's conception of evolution, as rendered in the model above (Fig. 1.), to discuss the curious fact that iconicity (and indexicality) is present already at the second stage, as mimetic gesture, but then makes a renewed appearance at the fourth stage, in the shape of the picture (SONESSON 2006, 2007a). I have also discussed, within the same framework, the final »missing link« in the progression from animal to man, the emergence of organism-independent artefacts (SONESSON 2007a, b, 2010a, b). Finally, I have considered two other, (nearly) missing links, the (principle of) relevance and the sign, as well as the act of imitation bridging them (SONESSON 2012a). Here, however, we will be concerned with the specificity of the picture sign.

1.2 *The emergence of the sign*

The sign, clearly, emerges somewhere within the mimetic stage, but even if it really »comes for free«, as Donald has claimed (personal communication), once the mimetic stage is reached, it might well contribute to the boot-strapping that permits later stages to arise, or it may play some other important part in evolution and development. To determine whether this is the case, we need to specify the criteria for something being a sign. Within semiotic theory, strange to say, the sign is never defined. When Peirceans and Saussureans quarrel over the presence of two or three entities in the sign, they never pause to ask themselves what kind of objects, defined by

2 This is an argument first formulated by the present author when Merlin Donald gave a series of lectures at the Centre for cognitive semiotics, Lund University, during the autumn term of 2009.

what type of features, are involved: but, clearly, before we know what we are counting, it makes no sense to start counting at all.³ The whole question becomes moot, if there is no reason to analyse any kind of meaning into separate parts, as suggested by both contemporary cognitive scientists and old-time existentialists and *Lebensphilosophen*. Nevertheless, apart from the phenomenological reasons for separating signs from other meanings, the study of the evolution and development of the human species also would seem to require such a distinction (cf. SONESSON/ZLATEV forthcoming).

So before we even ask ourselves whether something is a sign, we have to be clear about what a sign is. This involves not only deciding the criteria for analysing a phenomenon of meaning into two (or more) separate parts, but also those allowing us to posit an asymmetrical relation between these parts: not only does the expression have to be separate from the content, but the former should stand for the latter, not the reverse (cf. SONESSON 1989: 50ff., 1992, 2006, 2007a, 2007b, 2009a, 2009b, 2010). This can be done by combining what Edmund Husserl says about the sign (something which is directly present but not thematic refers to something which is indirectly present but thematic) and what Jean Piaget says about the semiotic function (there is a differentiation between the latter two instances, in the double sense, we will suppose, that they do not go over into each other in time and/or space and that they are perceived to be of different nature).

Let's start with the idea that there is meaning already in perception, first, because different perceptual phenomena can be combined, and second, because there are alternatives to some phenomena perceived. We thus have combination and selection, also known in classical structuralist semiotics as syntagms and paradigms. Not all such relationships are signs. In Husserl's (1939: 174ff., 1950: 238ff.) parlance, they form a paired association, or a coupling, when both items are directly present; they are an appresented pairing, or simply an appresentation, when one of the items is present and the other is not; and an appresentation becomes a sign when it is the absent item which is the theme (cf. LUCKMAN 1980: 205ff.; Fig. 2.). The most obvious case of an appresentation is when one looks at an object, necessarily from a particular point of view, but still perceives the whole of the object. As both Husserl and later on Gibson would insist, no matter from what

3 The same thing seemingly applies to the notion of representation in cognitive science, as I have suggested elsewhere (cf. SONESSON 2006, 2007a, 2007b, 2009b, 2010a).

point of view you look at it, what you see its the whole cube. The appresentation is that which motivates the experiential positing of something else as present along with the strictly presented object.⁴

FIGURE 2

The distinction between couplings, appresented pairings and appresentation, according to Luckman 1980, as summarized in Sonesson 1989

| | |
|------------------------------------|--|
| Paired association ("coupling") | Both items present |
| Appresented pairing | One of the items is present and the other is not |
| Sign | The present item "animates" the absent one. The absent one is the theme |

Inspired by the analogy to the sign, Sonesson (1989:50ff.) asked what might be the theme of an appresented pairing: In the case of retention and protention, i.e. the moments immediately preceding and following the present moment, it might be reasonable to say that it is the present moment that is the theme. In case of the hidden side of a perceptual object, it is less obvious that the directly perceived side must also be the sole thematic one. The appresentation of the other, the Alter as another Ego, however, would not seem to fit this scheme: we seem to be as immediately aware, as Husserl also claims, of the other's mind as well as of his body. Therefore, it seems that an appresentation must also allow for the two items in the relationship being equally in focus. But where then is the limit between a sign and a mere appresentation? In fact, it seems that when there is a double asymmetry, the part that is not directly given being thematic, and the one that is directly given being non-thematic, we are always faced with a sign (cf. Fig. 3.).

4 In semiotics, we are familiar with couplings and appresented pairings, in the form of iconic relations or iconicities, indexical relations or indexicalities, and symbolic relations or symbolivities. These are not signs, since they only involve two items and a relation between them, thus being instances of Secondness in Peirce's sense. Applying a term sometimes used by Peirce, I have called these instances of Secondness *grounds* (SONESSON 2006): thus, that which binds together two things on the basis of having some properties in common is called an iconic ground, etc. Peirce, it turns out, uses the term in a more limited sense, but this still seems to render his idea.

FIGURE 3
The distinction between couplings, appresented pairings
and appresentation, according to Luckman 1980,
as reviewed by Sonesson 1989

| | Directly present | Thematized |
|---------------------|------------------|-----------------------------|
| Paired association | Both items | Both items |
| Appresented pairing | One item | Directly given item or both |
| Sign | One item | Indirectly given item |

1.3 *Piaget on differentiation*

Yet a second criterion may be in order, not to define the sign exhaustively but to pinpoint the properties that permit it to emerge in childhood and evolution. This is the notion of differentiation, characterised by Jean Piaget.

According to Piaget, the semiotic function (which, in the early writings, was still termed the symbolic function) is a capacity acquired by the child at an age of around 18 to 24 months which enables him or her to imitate something or somebody outside the direct presence of the model, to 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 that is distinct from the signified.⁵ Indeed, Piaget argues that the child's experience of meaning antedates the semiotic function, but that it does not then suppose a differentiation of signifier and signified in the sign (see PIAGET 1945, 1967, 1970). In several of the passages in which he makes use of this notion of semiotic function, Piaget goes on to point out that »indices« and »signals« are possible long before the age of 18 months, but only because they do not suppose any differentiation between expression and content. The signifier of the index, Piaget says, is »an objective aspect of the signified«; thus, for instance, the visible extremity of an object which

5 Elsewhere I have suggested that mental images and memory are really different from the other phenomena listed in not being true signs (SONESSON 2011). Similar ideas, except the specification of the sign concept, are found in Husserl (1980) and Thompson (2007).

is almost entirely hidden from view is the signifier of the entire object for the baby, just as the tracks in the snow stand for the prey to the hunter. But when the child uses a pebble to signify candy, he is well aware of the difference between them, which implies, as Piaget tells us, »a differentiation, from the subject's own point of view, between the signifier and the signified«.

Piaget is quite right in distinguishing the manifestation of the semiotic function from other ways of »connecting significations«, to employ his own terms. We have already encountered those under the names of coupling and appresentations. Nevertheless, it is important to note that, while the signifier of the index is said to be an objective aspect of the signified, we are told that in the sign and the »symbol« (i.e., in Piaget's terminology, the conventional and the motivated variant of the semiotic function, respectively), expression and content are differentiated from the point of view of the subject. We can, however, 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 employ a pebble to stand for a rock, without therefore confusing the part and the whole: then the child would be employing a feature, which is objectively a part of the bird, or the rock, while differentiating the former from the latter from his point of view. Nor does the hunter, who identifies the animal by means of the tracks and then employs them to find out the direction the animal has taken, confuse the tracks with the animal itself in his construal of the sign, in which case he would be satisfied with the former. Both the child in our example and the hunter are using indices, or indexical signs, where the »real« connection is transformed into a differentiation in the sign.

On the other hand, the child and the adult fail to differentiate the perceptual adumbration in which he has access to the object from the object itself; indeed, they will identify them, at least until they change their perspective on the object by approaching it from another vantage point. And at least the adult will consider a branch jutting out behind a wall as something that is non-differentiated from the tree, to use Piaget's example, in the rather different sense of being a proper part of it. In the Peircean sense an index is a sign, the relata of which are connected, independently of the sign function, by contiguity or by that kind of relation that obtains between a part and the whole (henceforth termed factorality). When these relationships are given together in perception, we have a coupling in Husserl's sense; when only one of them is present, there is appresentation. Two items present together only become a sign, however, to the extent that one of them, identified as

the expression, is directly perceived but not in focus, and the other one, the content, is indirectly perceived while at the same time being the focus of the relation. An index, then, must be understood as indexicality (an indexical relation or ground, to use an old Peircean term) plus the sign function.

Piaget's notion of differentiation is vague and in fact multiply ambiguous, but, on the basis of his examples, two interpretations can be introduced: first, the sign user's idea of the items pertaining to different basic categories of the common sense Lifeworld; and, in the second place, the impossibility of one of them going over into the other, following the flow of time or an extension in space. Animals and small children may have difficulty making the required differentiation, and that is exactly what happens in the case of signs. The kind of differentiation that does not obtain for animals and children is apparently not the one involving a discontinuity in time and/or space (i.e., they do not think the mirror image is part of themselves) but rather that concerned with the different nature of the two correlates (i.e. the cat takes its own image to be another cat). Split into the two version of continuity or categoricity, differentiation may thus help to spell out the specificity of the sign (cf. Fig. 4.)

FIGURE 4

The sign defined by means of double asymmetry and differentiation, as presented by Sonesson 1989

(with an addition of a distinction between presentation and sign, based on the considerations in the present text).

| | Presence/Theme | | Differentiation | |
|---------------------|------------------|-----------------------------|-----------------|---------------|
| | | | | |
| Coupling | Directly present | Themitized | Continuity | Same category |
| Paired association | Both items | Both items | Yes | Yes |
| Appresented pairing | One item | Directly given item or both | Yes | Yes |
| Appresentation | One item | Both | Yes | Yes |
| Sign | One item | Indirectly given item | No | No |

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 from the elk, which is now somewhere else. Similarly, the colour configuration making up the photograph of my wife is distinct from the perceptual impression of my wife it gives me access to, but

even the latter is here now with me while my wife is most probably at home in our apartment 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.

But we should take these observations further: since what is at stake is a thematic structuring, and this structuring itself is relative to a subject for whom it is a part of the field of consciousness, the first part of the sign is in some sense a stand which the subject may take on the other. In more familiar terms, the first part of the sign is »about« the other. Of course, this more readily applies to the relation between the content and the referent, where the latter corresponds in the world outside of the sign to that with which the sign is concerned. Husserl (1980), in fact, makes this distinction clearly only in his study of picture consciousness, where he notes that the depicted Berlin palace is here in the picture, whereas the real palace is in Berlin (cf. SONESSON 1989: 27off., 2006: 2011). As I have suggested elsewhere (SONESSON 1989: 193ff.), we would thus have to suppose some kind of thematic hierarchy going (in the ordinary case) from the expression through the content to the referent.⁶

Thus we can minimally define the sign by the properties listed in Fig. 5.

FIGURE 5

Summary of the sign definition proposed in this article

Definition of the sign function

The sign contains (at least) two parts (expression and content) and is as a whole relatively independent of that for which it stands (the referent);

These parts are differentiated, from the point of view of the subjects involved in the semiotic process, even though they may not be so objectively, i.e. in the common sense Lifeworld (except as signs forming part of that Lifeworld);

There is a double asymmetry between the two parts, because one part, expression, is more directly experienced than the other;

And because the other part, content, is more in focus than the other;

The sign itself is subjectively differentiated from the referent, and the referent is more indirectly known than any part of the sign.*

* The referent will also ordinarily be more in focus than the sign if we suppose what in Anglo-Saxon philosophy of language is called »opaque contexts« to be the exception. Cf. Sonesson (1989:193ff).

6 In fact, in all his work, Husserl was very much concerned with the difference between what has here been called the content (»noema«) and the referent (»the noematical core«), but he does not seem to discuss it elsewhere in relation to the expression.

It will be noted that the present definition of the sign is considerably more specific than the one ordinarily employed in semiotic theory, notably by Peirce and his followers, for which all meaningful relations are signs, but it is at the same time much more general than the Saussurean notion, which tends to restrict the notion of sign to language and some other systems which are in some way similar to language. At the same time, it is more specific than both the Saussurean and the Peircean sign concepts, in that it clearly defines the requirements for two objects being called expression and content, while this is never done in the work of Peirce and only by example by Saussure. Taking my inspiration from the Piagetian idea of differentiation and Husserl's definition of appresentation, I first formulated this definition in *Pictorial concepts* (SONESSON 1989). At the time, I was unaware of Elisabeth Bates (1979: 43) having maintained that the sign (our expression) and its referent (i.e. the content) must be conceived as being similar and yet separate for a sign relationship to obtain. Thomas Daddesio (1995: 117) comments on Bates' observation as follows:

»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 which 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.«

From this it follows that it is impossible to conclude that only if an individual treats *a* and *b* as being distinct, the particular relationship between *a* and *b* is necessarily one of sign function. Daddesio's second case is that of categorization, which is important for 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 form 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« (cf. PARRON et al. 2008) 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 iconic sign, in which, by definition, expression and content must share at least some properties. To-

mas Persson (2008: 10ff.), referring to the sign concept developed here, has distinguished three modes of attending to pictures: surface mode, in which only »patterns, shapes, and colours, on the surface of the picture« are perceived (a picture of an apple is seen as patches of red and yellow); reality mode, in which the picture is seen as part of reality, instead of being about reality (the picture of an apple is seen as an apple); and, finally, pictorial mode, which involves both »an expectation of separation« and »an expectation of likeness« (the surface covered with patterns, shapes, and colours is seen as being about an apple).⁷ Mutatis mutandis, the case of non-iconic signs is the same, though instead of an »expectation of likeness«, there would be a more general »expectation of aboutness«. It would be natural to think, however, that the expectation of separation (or rather: differentiation) cohabits more uneasily with an expectation of similarity than with the mere expectation of aboutness.

1.4 *The picture as a particular iconic sign*

A picture is of course an instance of an iconic sign, i.e. a sign motivated (among other things) by a similarity relationship. An icon must be understood as iconicity (an iconic relation or ground, as Peirce originally called it) plus the sign function. But pictoriality is not just any kind of iconicity. It is of course visual iconicity, but that is not enough to characterize its specificity (cf. SONESSON 1989, 1993, 1994, 1995, 2001a, 2001b, 2003, 2008). The picture is characterised by what we have elsewhere called *resemantization* (cf. SONESSON 1989: 255ff.). The parts that are meaningless in isolation become carrier of particular portions of the overall meaning, once they are integrated into the whole. Like the phonemes /m/, /æ/, and /n/, forming the word /mæn/, the strokes and dots making up the picture of a man are in themselves meaningless even when considered in their particular spatial location; however after having been put together, the phonemes continue to be deprived of meaning as such, whereas the strokes and the dots begin to take on the aspects of different proper parts and attributes

7 As Persson remarks, Fagot et al. (2000) independently made a similar distinction between picture processing in terms of »independence«, »confusion«, and »equivalence«. These terms, however, appear to be less clear.

of the man they contribute to form. Put simply, the different parts and properties of the man are not distributed among the phonemes /m/, /æ/, and /n/, as they are among the strokes and dots forming the corresponding picture.⁸ This is possible because the picture is at the same time an object of perception and a sign.

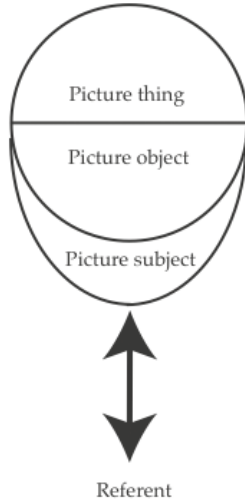
These properties of the picture are connected to a peculiarity of the picture sign that Husserl (1980) has described by the term »Bildbewusstsein«, which was taken up for discussion again much later, no doubt independently, by Richard Wollheim (1980), according to whom we »see in« the depicted object directly into the physical object which is the pictorial expression (SONESSON 1989: 262ff.; cf. SONESSON 2006, 2008).⁹ Two similar things assume the character of a picture only when pictorial consciousness is attached to them, Husserl (1980: 17, 16, 138f) contends (and, in addition, the similarity must be »anschaulich«; p 135). Pictorial consciousness puts three instances into relation: the *picture thing* (originally the »physical picture«), the *picture object*, and the *picture subject* (»Bildding«, »Bildobjekt« and »Bildsujet«, respectively). When the picture is said to be lopsided, this concerns the picture thing; but when we complain about the failure of the photograph to resemble the person photographed, it is the picture object that is incriminated (cf. Fig. 6.). However, it might seem less clear what constitutes the difference between the picture object and the picture subject.

8 It will be noted, then, that pictures do not have double articulation, as was once argued by Eco and Lindekens, nor do they lack elements without their own signification, as has been widely argued since; their case is different again. This argument is given more fully in Soneson (1989: 282ff.).

9 As I only discovered recently, two close followers of Husserl, Eduard Marbach (1993) and Robert Sokolowski (1992), have written extensively about pictures, but none of them refer to the Husserlean triad in its full version. Marbach has interesting things to say about the difference between so-called mental pictures and real pictures, anticipating Thompson (2007), but he does not really discuss how pictures relate to signs, and Sokolowski even seems to blur the essential distinction between presentations such as percepts and mental images and presentifications such as words and pictures (cf. SONESSON 2012b).

FIGURE 6

The picture sign containing the picture thing, the picture object, the picture subject, and the picture referent, as conceived in Sonesson 1989, 2006, 2008



In the photograph of a child, a figure can be seen which is in some respects similar to the child, but differs from it in size, colour, etc. The miniature child in a greyish violet is of course not the child that is »intended«, i.e. conceived (»vorgestellt«). The real child, the picture subject, is red-cheeked, has blond hair, and so on, but the picture object can only show up »photographic colours«. The first, then, which is what is »seen-in«, in Wollheim's sense, is the *picture object*. The second is the *picture subject*. It should be noted immediately that, although »photographic colours« do not mean the same thing to us as to Husserl, the distinction is still valid because even high-quality colour photographs, as well as paintings, are incapable of rendering the full scale of colours present in the real world of perception. According to Husserl (1980: 18), however, there is also a different kind of difference between the picture object and the picture subject, for while that Berlin Castle which we see is here, where the picture is, the Berlin Castle itself, as a thing, remains in Berlin.

It seems to me that the picture subject is made to accomplish a double task, which it cannot really sustain, that of content type and referent. It is in the relation between the picture object and the picture subject that pictoriality, according to Husserl, may be more or less *extensive*, and more or less *intensive*, i.e. concern a greater or lesser number of properties and realise them to a greater or lesser degree (»Extensität« and »Intensität der Bildlichkeit«, HUSSERL 1980: 56f.). Husserl maintains that there must always be a difference, however small, between picture object and picture subject, in terms of the »extensivity« and the »intensity« of their respective properties. If so, it should be sufficient to attenuate the »intensive« and »extensive« differences between them in order to have them approach gradually and then in the end coincide, at least as a thought experiment. But this could never happen, not even in thought, because the picture object is here, where the picture thing is, and the picture subject is somewhere else, in the place assigned to it in the Lifeworld (cf. HUSSERL 1980: 18, 79): indeed, as we have heard, the Berlin Castle, no matter where the picture is moved, will remain in Berlin. Moreover, the picture object is perceived, but the picture subject is only something about which information is conveyed (see SONESSON 1989: 276ff.). But this makes nonsense of the idea, suggested by Husserl himself, to compare the picture object and picture subject, as to »extensivity« and the »intensity« of their respective properties.

It would of course be an error to identify the triad picture thing, picture object and picture subject with expression, content and referent. The picture object is perceived, whereas the content of, for example, a verbal sign, is not; and there is a real sense in which the picture object is present here and now, together with the picture thing, which the verbal content can hardly be said to be. Nor is it feasible to assume that the picture subject is identical to the referent in the sense of a concrete object of the world, or even in the sense of being a type standing for a number of such instances. Many pictures may not have referents, in any of the latter senses, but they clearly have picture subjects: such is the case not only of the notorious unicorn, but of all the creatures emerging out of Escher's and Reutersvärd's pictures. Indeed, there may be a difference between the picture object and the picture subject of a unicorn picture, for instance if the unicorn looks grey or even blue, but we know that unicorns are white—although unicorns do not exist.

Thus, in Husserl's work, the picture subject has been made to mean two things which do not need to coincide: a) the picture object as it is really,

that is, without its »photographic colours«; b) the picture object in its right place (cf. Fig. 6.). As Husserl observes, the painting of the palace is here, but the real palace is in Berlin. Indeed, it was, at the time Husserl was writing. After 1946 and until recently, however, the Berlin Castle ceased to exist.¹⁰ This does not mean that the difference between the picture object and the picture subject disappears from a photograph taken in 1889 and observed at the present. The »photographic colours« are certainly not those we expect the real castle to have had. The picture object corrected according to our expectations will henceforth be called the *picture subject*. That which may exist elsewhere may be called the *picture referent*.

The whole point of the »impossible pictures« is that they point beyond themselves to something that cannot exist, their equivalents in the three-dimensional world (cf. SONESSON 1989: 266ff.). Indeed, their picture things are quite possible, as are in this sense their picture objects (consider the importance of »recognisability« to Escher). This is, I submit, the most interesting interpretation of the notion of picture subject: as the potential real-world equivalent of that which is »seen in« the picture thing, that is, of the picture object. Husserl (1980: 490) could be taken to suggest just this when he claims that what is seen in the picture is corrected for its deviations from the idea we have of the corresponding type, which imposes constraints on the possibilities of perception: being made of plaster contradicts our idea of a human being, so we withdraw it from the picture object.

The description of this phenomenological analysis and some corrections proposed to it occupy an appreciable part of *Pictorial concepts* (SONESSON 1989: 262ff.; cf. SONESSON 2008, 2012b). More recently, Husserl's analysis was taken up in a similar way by Blanke (2003) and Stjernfelt (2007: 289ff.), without adding anything new to Husserl's analysis nor taking my reworking of it into account (which is somewhat curious, since both quote SONESSON 1989 in their references). Stjernfelt (2007:299) observes that Husserl's notion of picture is much more restricted than Peirce's notion of iconicity, notably as far as sense modalities are concerned, but this precisely misses the point that pictoriality, in the Husserlean sense, is something more specific than iconicity. Evan Thompson (2007: 267ff.) returns to the same

10 It is now being rebuilt, but according to a new model by Francesco Stella, so it is hardly a question of the same referent being re-established.

Husserlean texts in the context of a discussion of mental images without, however, having much to say about real pictures.

To end this section, it is worth-while to compare the three modes of attending to pictures suggested by Persson (cf. I.3.) with Husserl's different picture layers.¹¹ His surface mode, in which only »patterns, shapes, and colours, on the surface of the picture« are perceived, would seem to be restricted to the picture thing. His reality mode, in which the picture is seen as part of reality instead of being about reality, may be taken to involve the picture subject and/or the picture referent. His pictorial mode, finally which involves both »an expectation of separation« and »an expectation of likeness«, would need to take into account all layers of the picture sign (though it may not always require a distinction between subject and referent).

2. On the way to empirical research

It is time to have a look at some examples of psychological and primatological research that might be relevant to the issues of emerging semiosis in children and in primates. A major difficulty when comparing psychological studies and semiotic theory consists in the difference of terminology. Many psychologists, like Judy DeLoache (1995: 67), claim that an »entity that someone intends to stand for something other than itself« is a »symbol«. In DeLoache's own work, »symbols« in this sense are exemplified by pictures, videos, and scale-models. In this article, we will follow the practice in semiotics of using »sign« as the general term and reserving »symbol« for signs which are highly conventionalized or otherwise rule-bound. In this sense, pictures, videos, and scale-models are primarily iconic, although they may of course contain symbolic (as well as indexical) features. Indeed, we will take it for granted that all, or most, signs contain iconic, indexical, and symbolic aspects, with one of these being normally more prominent, or dominant, in the Prague school sense of organizing the other aspects for their own purpose (such as indexicality in the predominantly iconic photograph; cf. SONESSON 1994).

11 Although this, as far as I know, never discussed by Husserl, I think these distinctions, except for the referent, should be understood as »moments« (non-independent parts) rather than real parts (which are independent), in the sense of Husserl (1913).

A more fundamental problem is that psychological research is often not conducted in terms of semiosis at all, or if it employs semiotical terms, these are not clearly defined. Although she uses the misleading term »double representation«, which confuses the level of percept and sign (cf. I.2), Judy DeLoache seems to be more explicitly concerned with semiotical issues than most. She maintains that, in order to understand signs (her »symbols«) such as pictures, videos or models, one must grasp the duality of the sign artefact, i.e. understand that pictures and videos are 2-D objects in themselves as well as representations of other things, which are usually 3-D objects. This involves experiencing both the similarity and the difference between the picture and the object depicted and grasping the asymmetric relationship between them. Interestingly, DeLoache started her experimental studies of children's picture understanding more or less at the same time as I initiated my phenomenological analysis of pictures (SONESSON 1989).

In the following, we will look at the experimental evidence, both that handed down to us by the psychological tradition and the smaller part being due to the initiative of cognitive semiotics, from different points of view: the relation between the picture and the world outside the picture (II.1); the difference between affordances and referential meaning (II.2); actions as a criteria of understanding the picture (II.3); and, finally, the difference between the scale of iconicity commonly accepted and the interpretation in terms of different kinds of iconicity and indexicality (II.4).

2.1 *The picture world and the real world*

Interpreting pictures and videos appears to be surprisingly difficult: experiments by DeLoache and her collaborators (e.g. DELOACHE/BURNS 1994) suggest that pictures are understood later than language (around 2.5 years). The problem may be that iconicity gets in the way of the sign function. More than any other sign, the iconic sign is no doubt subject to that kind of confusion of levels diagnosed by Bates and Daddessio (cf. I.2.). This interpretation is consistent with another of DeLoache's findings, according to which scale models are even more difficult to understand than pictures. Children begin to understand the sign function of the scale model at around the age of 3 years (DELOACHE 2000; DELOACHE et al. 1991). However, 3-year-olds still fail to perceive the dual nature of the model if its salience as an object is increased (DELOACHE 2000). This result was predicted in *Pictorial*

concepts (SONESSON 1989), which argued that the discovery of the similarity between one object and another was contingent of the realisation of their sign character. Thus, objects that have only two salient dimensions may more easily be used to signify an explicitly three-dimensional object than vice-versa. Similarly, familiar material (such as paper or canvas is for us but not necessarily for all cultures) would more easily serve as the expression of a picture than less familiar ones. It was also suggested (something which remains to be shown) that it should be even more difficult to discover the sign character of animate beings. Thus, theatre requires an elaborate system of conventions.

In these studies, children are for instance shown on a video how a toy is being hidden under a chair, and then they have to find this toy in the real room (DELOACHE/BURNS 1994; SCHMITT/ANDERSON 2002; TROSETH 2003a; TROSETH/DELOACHE 1998). Small children may rush into the room where the object is found, stand in front of the object holding the picture in their hand, and still be unable to identify the object in the picture and the object depicted – even when the latter is not hidden but in full view (LENNINGER 2009). However, when 2-year-old children observed themselves »live« on the television for 2 weeks prior to performing a retrieval task, they were able to use the video presentation of a hiding event to find the toy. They could even transfer that knowledge to new situations, and they were successful at finding the toy after a picture presentation of the hiding place (TROSETH 2003b). This suggests that children may be able to understand the sign function of photos and videos at an earlier age if they have had a lot of experience with the relevant medium. Similarly, by 15 months infants will imitate actions seen on a television screen, immediately or after a 24-hour delay, but their performance following a live demonstration of the same action is better (BARR/HAYNE 1999; MELTZOFF 1988). Even at the age of 30 months, their imitation level after watching a live demonstration is higher than after watching a video demonstration (HAYNE et al. 2003).

Valerie Kuhlmeier et al. (1999) presented chimpanzees with a hiding task involving four possible hideouts in a set-up similar to the one DeLoache and Burns (1994) used with children. Chimpanzees were shown either a photograph of just the furniture where the reward was hidden (e.g. a chair), or they were shown a photograph of the whole room in which the hiding place (a chair) was pointed out; or, finally, they were presented with photos of all four hiding places the correct one being pointed out. Under these circumstances, however, the older chimpanzee was reliably able to find the

reward in the real room after she had seen the hiding place in the photos, but the younger one failed. The authors suggest that young chimpanzees are unable to understand the relationship between the presentation of a room in a picture and a real room, just like young children, but that older chimpanzees grasp this relational similarity between pictures and the real world. Kuhlmeier et al. (1999, 2001, 2002) also tested whether chimpanzees are able to recognize the relation between a scale model of an enclosure and the real enclosure. The chimpanzees were able to use the information they were given through the scale model (i.e. colour, shape or position of the hiding place) to find the hidden reward in the real enclosure. Their performance level was higher when object cues were present (e.g. colour and shape) than when only spatial ones were offered (KUHLMIEIER/BOYSEN 2002; POSS/ROCHAT 2003).

A notable difference between DeLoache's testing situation and that of Kuhlmeier, however, is that the former involved an unknown location whereas the latter took place in the familiar cage. Since familiarity has often turned out to be an important factor in other studies of children and apes, this difference is perhaps not negligible (cf. LENNINGER 2009 for an attempt to eliminate this difference by making the testing ground of children relatively familiar). It should be observed that the task set by DeLoache involves more than the recognition of the picture as a picture – it requires an action: fetching the hidden object. Attempts to repeat the task without the moment of hiding, however, does not change the results fundamentally (cf. LENNINGER 2009). 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 (2000; and RANKIN 2002). Other facilitating moments, not thematized by the researcher, are various kinds of indexical scaffolding used by DeLoache, involving pointing as well as creating neighbourhood relations between the picture and the depicted object. In other words, not only language but also gestures and the placement of objects in contiguity, which are all semiotic operations, are used in these experiments without this being particularly noted (except for language, in Callaghan's case).

Another one of DeLoache's experiments seems to indicate that the sign function is at least part of the problem. When the experimenter, instead of talking about a model and a real room, tells the children that the search has to take place in the same room, which has shrunken since it was last seen, the task is accomplished much more easily (DELOACHE et al. 1997). The dif-

ference, clearly, is that the two instances are here connected by a narrative chain rather than by a sign relationship. In another experiment, DeLoache (2000) places the scale model behind a windowpane, in order to make it more similar to a picture, with the expected results. In fact, however, two things happen here which would have to be separated: the object becomes less prominent because it has less the appearance of three-dimensionality; and it is put into a frame, which creates a centre of attention.

In Sara Lenninger's (2009, 2012) repetition of DeLoache's study, both the testing ground and the nature of the task were thus modified. But an additional test realised by Lenninger may be of more transcendence in this context. Lenninger found that the children who were unable to find the object in the other room, even when carrying the photograph with them, could still identify the object from one picture to another. Thus, it appears that the similarities between one picture and another are of easier access than those between a picture and the world. The question then becomes whether such a identification can take place in surface mode, that is, comparing simply the colour configuration of the two photographs without attending to the picture object. No doubt, these two configurations are more similar to each other, from some abstract point of view, than any of them are to the real-world object, already because both consist of colour spots on a two-dimensional surface. Nevertheless, I think the identification cannot be understood to be occurring in surface mode, since the pictures are different, showing the same object from different angles of vision. Thus, it seems that the picture subject must be involved.

To finish this section up with a few phenomenological glosses, it might be concluded that DeLoache's study involves the referent. To identify the picture subject/picture object appears to be easier. The comparison between two pictures would presumably take place at the level of picture objects. The distinction between picture subject and picture object could be expected to be late since it involves knowledge of the world.

2.2 *Affordances and referential meaning*

According to DeLoache (2004), the process by means of which children learn to understand the duality intrinsic to signs is gradual. Small children try to grasp and even eat pictures. Thus, at 9 months of age, children manually explore pictures and images of still and moving objects on a television screen

as if they were real objects, i.e., they grasp, pat and rub them. But if they are presented simultaneously with a real object and with its picture, they preferentially pick a real object over the corresponding depiction (DELOACHE et al. 1998; PIERROUTSAKOS/DELOACHE 2003; PIERROUTSAKOS/TROSETH 2003). At the same time, however, even children 5 months of age look longer at a doll than at its picture (DELOACHE/BURNS 1994). But it is only around 1 year of age that children stop manipulating pictures as if they were real objects (DELOACHE et al. 1998).

Similarly, apes and monkeys, and even pigeons, have been shown to demonstrate an ability to discriminate between real objects and the corresponding pictures (PARRON et al. 2008; IMURA/TOMONAGA 2003; CABE 1980: 313f.). When picture-naïve baboons and chimpanzees were presented with a real banana piece and the picture thereof, they preferred to pick the real banana (PARRON et al. 2008). The gorillas did not show this preference. When they were presented with a choice between a picture of a banana and a picture of a pebble, they almost uniformly choose the banana picture. Some baboons and gorillas even ate the picture, whereas the chimpanzees did not. These results suggest that the gorillas and at least some baboons did not see the pictures as representations of bananas. Although the chimpanzees did not mistake the picture of a banana for a real banana to the point of eating it, it is still unclear whether they processed the pictures as signs referring to bananas.

This shows that the picture and its referent are seen as different, not necessarily that they are seen as being sign and referent. There may be other explanations; one could speculate that the real doll and the real banana are seen as more prototypical instances of their respective categories; or, alternatively, that they may simply be more interesting because of having more perceptual predicates (SONESSON 2009). In the first case, the banana picture or the doll picture are taken as bad instances of the category banana and doll, respectively. When better instances, which happen to be the real banana or the real doll, are present, they are chosen, but in their absence, instances that do not fully realise the category will have to do. The notion of prototype used here is that of Eleanor Rosch (1975): in this conception, categories are defined by central examples, and all other instances are located more or less close to these examples, but still within the category. This may yet be a kind of duality (indeed a multiplicity), but it is not a sign in the sense defined above. The second explanation avails itself of the fact that a three-dimensional object has

more sense properties that might be explored than a couple of colour spots on a plane surface. Thus, it will, under normal circumstances, attract more abiding attention. In this case, no real awareness of duality would seem to be required.

Even though the process of development may be continuous, distinct qualitative differences have to be accounted for. James Gibson (1980) was adamant that referential meaning, exemplified by the picture and thus corresponding roughly to the sign as defined here, must be distinguished from a more generally present kind of meaning, i.e. affordances. An affordance, Gibson (1977: 67) tells us, is »a specific combination of the properties of its substance and its surfaces taken with reference to an animal« (italics deleted). More informative are some of the examples given: the affordance may be the graspability, or the edibility, of a thing. Graspability can be understood as the aptness to be grasped. Edibility must be interpreted as the susceptibility of being eaten. These are inferences which might be said, using a phenomenological term, to be »sedimented« onto an object of the Lifeworld: accordingly, an apple, once it is seen to be an apple, is also perceived as something which may be grasped and then eaten, because these are events being known to have taken place (and »properly« so) with other apples at other times. The apple does not stand for its own graspability or edibility. Unlike the case of the sign, there is not some object here that is directly given without being in focus which points to something more indirect that is also more emphasised (cf. SONESSON 2009b).

Graspability and edibility are precisely the properties that are at stake in the experiments with children and apes reported above. At least part of the problem is to understand that the picture of the banana, although it looks much like the banana, does not have either the graspability or the edibility of the real banana. The picture affordance has to develop. Affordances cannot be the purely natural affair Gibson takes them to be. As I have pointed out elsewhere (SONESSON 2009b), graspability, and indeed edibility, are later on culturally modified. To the child and the ape, however, everything may still seem to afford grasping and eating. Gibson himself mentions the post box, apparently without realising that he is thereby introducing a highly cultural object: »naturally« the post box affords putting just about anything inside (as well as pouring something from the inside), and that is no doubt how the infant would see it, but to adult members of our culture, it only affords introducing letters. In the same way, the picture

affordance, which is distinct from the referential meaning of the picture, has to evolve if the picture is going to be treated as a sign.¹²

Interestingly, the issues of graspability and edibility return again in the anecdotes told about African groups not having the use of pictures. Members of the Me' tribe, Muldrow (as reported by DEREGOWSKI 1973) tells us, smell the pictures, taste them, bend them, and so on; in short, they behave like a child exploring his world. According to Deregowski (1973: 167; 1976: 20) not only pictures, but also materials like paper are unknown to the Me'; therefore, when Deregowski had pictures printed on coarse cloth, animals well known to the tribe could readily be identified. In the case recounted by Muldrow, it seems the Me' were so busy trying to discover the fundamental properties of paper as an object in itself that the iconic properties, those making it a pictorial sign of something else, were not noted; other attributes became dominant in their experience of it. It therefore seems (as I suggested in SONESSON 1989) that for something to be a pictorial sign of something else, it must occupy some relatively low position in the particular Lifeworld hierarchy of »things«. When it is unfamiliar, it obviously enters the centre of attention, and thus can no longer be low ranking on such a scale.

Familiarities with paper or cloth are facts of particular cultures. Paper, which is too prominent to the Me' to serve as a sign-vehicle, traditionally carries this function in Western culture. But I (SONESSON 1989) suggested that there probably also would be universals of prominence: thus, for instance, two-dimensional objects are felt to be less prominent than three-dimensional ones and may thus more readily serve as expressions. In this sense, it is not true that the object is its own best icon, as is ordinarily claimed – at least if iconic means iconic sign. The objects of the common sense world are three-dimensional: much less is required for a two-dimensional object to be able to represent one of these objects than for another three-dimensional object to do so (cf. SONESSON 1989, 1994, 2007a, 2007b). This is precisely what is suggested by DeLoache's experimental results according to which scale models are understood even later than pictures (DELOACHE 2000). As noted also by DeLoache, this result contradicts what

12 Such an affordance would be very much like a connotation in the sense of Hjelmslev (1943) – not, of course, in the distorted sense given currency by Roland Barthes (cf. SONESSON 1989).

is expected by common sense. But, on second thought, it still seems reasonable if the problem is separating the sign and its referent.

The difference between pictures and scale-models corresponds to a distinction I have made elsewhere between *primary and secondary iconic signs* (cf. SONESSON 1994, 2008, 2009b, 2010a, 2010c). A *primary iconic sign* is a sign in the case of which the perception of a similarity between an expression E and a content C is at least a partial reason for E being taken to be the expression of a sign the content of which is C. That is, iconicity is really the motivation (the ground) or, rather, one of the motivations for positing the sign function. A *secondary iconic sign*, on the other hand, is a sign in the case of which our knowledge that E is the expression of a sign the content of which is C, in some particular system of interpretation, is at least a partial reason for perceiving the similarity of E and C. Here, then, it is the sign relation that partially motivates the relationship of iconicity.

Pictures are of course primary iconic signs, in this sense, and they may well be the only kind there is. In fact, given the facts about picture perception in apes and small children referred to above, there is reason to believe that pictures are only primary iconic signs for human beings which have reached at least the age of 2 or 3 years. Before that age, it could be argued, pictures are not primary iconic signs, because they are no signs at all, but are rather ranged with the object they depict in one and the same category. This shows that the primarity and secondarity of iconic signs is relative to a given (collective) subject.

FIGURE 7

Two droodles and a picture which can be read as a droodle



a) Olive dropping into Martini glass or Close-up of girl in scanty bathing suit (inspired from Arnhem as adapted in Sonesson 1992). b) Carracci's key [Mason behind wall]; c) face or jar (inspired by Hermerén 1983: 101).

There are two kinds of secondary iconic signs, those in which case there could be said to be too much iconicity for the sign to work on its own, such as objects becoming signs of themselves in some capacity, and those which have too little iconicity for the sign function to emerge without outside help. A car, which is not a sign on the street, becomes a sign at a car exhibition, as does Man Ray's iron in a museum. We have to know the showcase convention to understand that the tin can in the shop-window stands for many other objects of the same category; we need to be familiar with the art exhibition convention to realise that each object merely signifies itself; and we are able to understand that the tailor's swatch is a sign of its pattern and colour, but not of its shape, only if we have learnt the convention associated with the swatch (cf. SONESSON 1989: 137ff., 2008). Indeed, without having access to a set of conventions and/or an array of stock situations, we have no possibility of knowing either that something is a sign or what it is sign of: of itself as an individual object, of a particular category (among several possible ones) of which it is a member, or of one or another of its properties.

In other cases, the sign function must precede the perception of iconicity because there is too little resemblance, as in the manual signs of the North American Indians, which, according to Garrick Mallery (1881: 94f.), seem reasonable when we are informed about their meaning. In Rudolf Arnheim's terms (1969: 92f.), a »doodle« is different from a picture in requiring a key, as Carraci's mason behind a wall (cf. Fig. 7b), or in »Olive dropping into martini glass or Close-up of girl in scanty bathing suit« (cf. Fig. 7a). While both scenes are possible to discover in the latter case, both are clearly underdetermined by it. There are two ways in which we can try to avoid such an ambiguity. One is to fill in the details, in particular the details that are characteristically different in an olive and a navel, in the air and a pair of thighs, etc. At some point the doodle will then turn into a genuine picture (as would seem to be the case with a doodle of a face much more rapidly than is true of less familiar objects; cf. Fig. 7c). The other possibility, which is the only one considered by the critics of iconicity, is to introduce an explicit convention, such as Carraci's key.

DeLoache's scale models clearly exemplify the second kind of secondary iconic signs: the problem consists in discovering that they are signs and not the objects themselves. This, at least, is true for the children. In amusing video clips – amusing to adults – DeLoache shows the children trying to sit down on diminutive models of chairs, and the like. To adults, how-

ever, scale-models would really be more similar to what I have termed elsewhere pseudo-identities, which are objects having all or most perceptual properties of the thing they stand for, but not those defining them: wax food, which cannot be eaten, the dummy showing the cloths in the shop window, which is however not an animate being, etc. (cf. SONESSON 1989: 336ff., 2008). Just like the property of being of wax is perceived to exclude the wax food from the category of edible things, the small scale of the scale model of a chair eliminates it from the category of chairs. It takes some maturation and/or some general experience of the world to see that – not, however, the learning of any specific convention.

2.3 *From image to action*

The most direct reaction to seeing a picture, or experiencing any other sign, is interpretation. In the case of individuals who do not master any of the semiotic resources we use for conveying such interpretations between us, or who do not have a sufficient grasp of these resources, interpretation as such cannot be used to see if any semiotic process is going on. In the case of small children and apes, therefore, actions have been used to stand in for interpretations.¹³ DeLoache uses the act of finding a hidden object to show comprehension of the picture presented. Although not hiding the objects, Lenninger still retains the act of finding as a criterion. The amounts of looking or sucking have been used in the case of even smaller children. In the classical study of the home-raised chimpanzee, named Viki, who had been trained (unsuccessfully) to master spoken language (HAYES/HAYES 1953), a different kind of action was used: the imitation of the actions shown in the picture. Viki was reportedly able to imitate an action presented to her in the form of a video, a black-and-white photo, or a line drawing. However, none of this was systematically tested; and the report does not provide any methodological details (HAYES/HAYES 1953). The recent study by Hribar and collaborators (HRIBAR/CALL/SONESSON in press) with the help of the chimpanzee Alex at the Leipzig zoo can be seen as a remake of the Viki study with tighter controls. At the same time, our study systematically

13 Interestingly, to Peirce the primary »interpretant« was also an action. But, as we shall see, such interpretants are interpretationally under-determined.

uses the ability to imitate the behaviour rendered in the pictures and videos as an indication of the presence of picture understanding. In the end, this led to the introduction of a further kind of variation: since what are depicted are actions, and since actions can be complete or not, we wanted to see whether the choice of rendering the final or penultimate phase of the action sequences made any difference.

Overall, the results suggest that – in some sense or other – Alex understood that the movies, photos and drawings represented the actions that the experimenter wanted him to imitate. Although there were significant differences between the results in all conditions, Alex performed above chance in all of them, except on the drawings (which he was however able to discriminate). The experiment was repeated with differently sized pictures, as well as with black-and-white as opposed to colour photographs, without finding any differences. Finally, the task was conducted with pictures representing still actions with an incomplete goal (incomplete) as well as with pictures of the same action in which the goal had been achieved (end state), once again without any significant difference between the two pictorial stimuli, while these had fewer correct responses compared to a live model.

The fact that the success rate in the case of live action, videos, and static pictures were so different would seem to indicate that some kind of interpretative work was going on. In the cases when the action was shown on video, it is not possible to say whether the live illustration of the action and the video were qualitatively different to Alex. Nevertheless, the quantitative difference resulting from using a video instead of a live action as a prompt may be taken to indicate such a qualitative difference. In any case, a still photo serving as a prompt for a real action must certainly be considered different from the action, at the same time that it appears to have been taken by Alex to »stand for« it, as shown by the fact that he performed the represented action. If so, there is a clear differentiation between expression and content. To suggest that Alex is simply confusing the still photo, and even more the photo of the incomplete action where the picture prompting the action is two times removed from the action requested (as a sign and as a pre-final phase), seems indeed far-fetched. However, it is less clear whether the double asymmetry characteristic of signs could be attributed to Alex.

It is possible to conclude that picture understanding is within the purview of chimpanzee capacities, and since Alex was neither language-trained nor engaged in any other form of sign use, we can also suppose that it is

possible to understand pictures as iconic signs, quite independently of language (cf. SONESSON/ZLATEV forthcoming). On the other hand, it is not completely clear why Alex would reproduce actions depicted in complete or incomplete photos but not actions depicted in drawings. If this was simply a question of the amount of information conveyed, another result might be expected. One possibility is that Alex did not see the drawings as representations of the actions that he was required to reproduce, but merely as a series of lines on a white background, i.e., due to the degraded nature of the representation he operated in the »a-mode« of Daddesio (1995) or the »surface mode« of Persson (2008). The fact that he could discriminate between the drawings does not necessarily tell against such an interpretation.

A semiotically »rich« interpretation of this result could be that Alex not only used the picture as a sign for the real-world action, but that he could simultaneously recognize a complete action including its goal state from an earlier phase of its development, i.e. that he was capable to grasp a form of indexicality (in this case temporal contiguity) indirectly through the sign. Indeed, the fact that the static representation of the penultimate phase and of the final one served equally well to initiate the copying behaviour on the part of Alex could be given a positive reading. Certain presuppositions, however, would have to be taken for granted. Perception leads to identification because each perceptual moment is saturated with possible earlier phases, which are more or less determined, as well as with possible later phases, which may receive more or less determination. In phenomenology, the former ones are called *retentions* and the later ones *protentions* (cf. SONESSON 1989). Alex had been trained on the complete actions. If the only thing you are offered is a single phase of these actions, then you have to pretend and/or retain the other phases in order to see the actions as being the same. Some actions are no doubt only a way of getting the members of the body into a given static position, which is the real bearer of the meaning. In these cases, at least, it is natural for the final position to be as felicitous for suggesting the action to imitate as is the action as a whole. On the other hand, the fact that the penultimate phase serves as well to obtain this effect might be taken to suggest that Alex goes through a more complex kind of interpretative work, perceiving the single, static phase as being the expression for which the full action is the content.

Nevertheless, the principle factor that argues against such an interpretation is the lack of any evidence concerning novel actions. Since all actions involved were taken from the set of actions on which Alex had

been trained earlier on, and since Alex has been known to have difficulties with the imitation of novel actions, we cannot exclude that a much more simple explanation in terms of conditional learning could be given. This would suppose that Alex could generalise what he had learned from the training of the complete actions, not only to the rendering of these actions involving different kinds of iconic transformations but also to the different single static phases of such actions. If he is supposed to make this generalisation on the basis of surface mode perception of the pictures, then it is not clear whether what is perceived is sufficiently similar to allow such a generalization. Given our results, it appears more difficult to tell generalizations starting out from object mode and pictorial mode apart. Further investigations must tell how far the »rich« interpretation can be supported.

2.4 *Degrees or kinds of iconicity and indexicality*

Tara Callaghan (2000) used a different approach to investigate young children's understanding of signs. She asked 2.5-year-olds and 3-year-olds to match some potentially semiotic stimuli to one of two choice objects. The stimuli used were of four different types that differed in iconicity (in what was intended to be an increasing order): »graphic symbols«, »pen symbols«, »colour symbols« and »replica symbols«. While 2.5-year-olds failed the task with all stimuli, 3-year-olds matched all the signs correctly to the referent. But 3-year-olds' performance was significantly poorer in the »graphic condition« than in other conditions, suggesting that the »level of iconicity« (which was the lowest for the »graphic symbols«) had an effect on children's performance. Callaghan (2000) also suggested that the »pencil, colour and replica symbols« share a quality of realism that the »graphic symbols« do not have, and that this realism was sufficient to provide superior performance. In this matching task, two objects with the same basic and verbal label were paired, so that the children could not simply match the verbal label of the stimuli with the correct object when making the choice. But when 2.5-year-olds were presented with objects that had different verbal labels, so that they could match the verbal labels when making their choice, their performance rose above chance level. Callaghan argues that both verbal and image-based representations are used when processing graphic symbols of objects in their real world, but that younger children might rely more on verbal presentations.

The home-raised chimpanzee Viki also was required to match a real object to one of two choice pictures (HAYES/HAYES 1953). The correct picture was a sign of an object of the same class as the real object. Viki's picture stimuli were of two types: realistic colour pictures and black-and-white line drawings (comparable to the »pen symbols« in Callaghan study). She was successful with both types of choice stimuli. Whether Viki knew the labels for all the choice stimuli is impossible to know, and so there still remains the possibility that object labels helped Viki with matching real objects to pictures. More recently, however, testing the famous bonobos Kanzi and Panbanisha, Persson (2008: 245ff.) showed that they were able to map lexigrams to pictures, and vice-versa, even in cases of low degrees of »realism«.

The fact that in the Alex study (HRIBAR et al. in press) the subject consistently performed better on the live condition and that there were a decrease both in success and correctness from the live condition to the video condition as well as from the video condition to the photo condition seems to confirm the idea, voiced by Callaghan (2000), that there is a kind of »scale of iconicity« involved. This idea first seems to have been introduced by Charles Morris (1946), to whom iconicity becomes a question of degrees: a film is more iconic of a person than is a painted portrait because it includes movement. Abraham Moles (1981) constructed a scale comprising thirteen degrees of iconicity from the object itself (100%) to its verbal description (0%). Such a conception of iconicity is problematic, not only because distinctions of different nature appear to be amalgamated, but also because it takes for granted that identity is the highest degree of iconicity and that the illusion of perceptual resemblance typically produced, in different ways, by the scale model and the picture sign is as close as we can come to iconicity besides identity itself (cf. SONESSON 1998). Kendon (2004: 2) also argues that what masquerades as a scale of iconicity in gesture studies actually involves a multiplicity of factors. A more neutral way of describing the case may well be to say that the original perceptual appearances have been submitted to different kinds of transformations (cf. GROUPE μ 1992; SONESSON 2004). Our results would however seem to confirm that there is something to the idea, at least if we exclude replicas, on one extreme, and verbal description, on the other.¹⁴ Perhaps we should rather talk about fa-

14 Replicas may be 100% iconic, but it is more difficult to see them as signs than, for instance, pictures, as DeLoache's experiments have shown. Sonesson (1994) distinguished two kinds of

miliarity here, relative to the direct experience in the world of perception, i.e. the Lifeworld (perhaps this is Callaghan's »realism«). It seems obvious, in any case, that this is not a question of mere quantity of properties corresponding between the sign and its target (Moles' 0 to 100%) but of certain properties being essential. A more thorough variation of properties would be needed to establish this, but so far no study seems to have been concerned with such a variation.

If we look at the issue from a more general point of view, however, we do seem to be able to discern certain qualitative differences, not only between iconic and indexical signs but also between difference varieties of them. According to Tomasello et al. (1997), 30-month old children can understand, not only from pointing gestures but also from »markers« placed on top of the intended box as well as from »replicas« of the box held up in front of them, in which one of three boxes a reward is hidden. In contrast, chimpanzees could be trained to respond to one of the types of cues, but did not generalize to the others. These results have been considered to demonstrate that children, but not apes, understand communicative and cooperative intentions. In our sense, they would seem to be able to grasp the sign function. Zlatev et al. (in press) repeated this study with several modifications, only some of which will be discussed here. There were several reasons for wanting to study children younger than 30 months. At that age, language is already considerably developed, which makes it impossible to separate general semiotic capacities from the mastering of language. Furthermore, other studies have shown that children as young as 14 months understand pointing in a similar task while, as we have seen, the understanding of pictures emerges considerably later, followed by replicas. Our study therefore involved three age groups: 18, 24 and 30 month olds. In addition, we added a fourth type of sign – pictures. Based on previous research we predicted: (a) a less clear-cut advantage for the children over the chimpanzees when they were younger than 30 months; (b) better performance (for both children and chimpanzees) for indexical than iconic signs (pointing and marker vs. picture and replica) and (c) within these categories: better performance for indexicality with vectoriality than indexicality based on mere contiguity (pointing vs. marker, picture vs. replica). It will be noted that

iconicity here, primary and secondary iconicity, depending in the iconic relation or the sign relation being most directly accessible.

the distinction between pictures and replicas correspond to the one made above between primary and secondary iconic signs. Also the distinction between two kinds of indexical signs has been made beforehand: real indicators, such as fingers and arrows, I have suggested (SONESSON 1989: 47), are equally contiguous to a number of objects which they do not indicate, for instance to the things which are at the opposite side of the arrow-head, in the direction to which it does not point, and therefore they cannot be exclusively explained by indexicality. Interestingly, as I there remarked, René Thom (1973) wants to construe indexicality in a way unknown from the work of Peirce: it is the forward thrust of the arrow-head as imagined in water or the sentiment of its slipping from our hands. Since this is very much a distinction in the spirit of Gestalt psychology, we could use the term ›vectoriality‹ to describe it. But Thom is clearly thinking about the much more specific category of indicators.¹⁵ It seems natural for an indexical sign incorporating vectoriality to be easier to grasp than one without any vectoriality, as is the case with the marker.

Four chimpanzees were tested at Lund University Primate Research Station Furuvik and three groups of children at the Humanities Laboratory, Lund University. In the majority of the cases the results for the apes failed to reach significance. Still, there was a tendency for indexical signs to be more often correctly interpreted than iconic signs. Preliminary results for the children show the same tendency and thus support the hypothesis that 18-month olds most often understand pointing and more rarely markers, while only some 24-month olds understand the iconic signs. The 30-months olds usually understand all four types of signs.

3. Conclusion

We started out from phenomenological analyses of semiosis and went on to empirical studies. There have been empirical studies conducted beforehand within psychology, so we had to start asking ourselves to what extent they were relevant for the kind of questions pertaining to semiosis. This, again, prompted not only new empirical studies but also more phenomenological

15 Of course, from this point of view, the term ›index‹ is a misnomer, for although the finger so termed may function as an index, its specific function goes beyond that.

reflections. For the children looking at picture, the world of semiosis may appear to be self-contained. To take the step out from the world of pictures to the real world, the Lifeworld, requires a long apprenticeship. For us, however, the real world is precisely the world we are thinking about. This is exactly the meaning of intentionality in phenomenology. Peirce also had a way of talking about this: from the »immediate object« you can always go on to the »dynamical object« (and from there, we might suppose, to an even more dynamical object). In our case, this means that a return is also required. Empirical studies can help us understand the issues involved, but they cannot resolve them on their own. They bring up new questions for phenomenological reflection.

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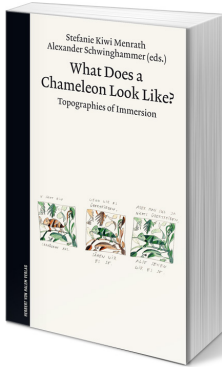
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Bildwissenschaft



Stefanie Kiwi Menrath /
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Liberating the concept of immersion from the technical and digitally-oriented rubrics under which it is often thought, *What does a Chameleon Look Like?* indicates the concept's applicability throughout the humanities. It assembles recent interdisciplinary work on immersion as technique and cultural topos: While the human-machine relationship has long been one of fascination and utopian positivism, the advent of visual technologies such as television in the 1960s created a certain uneasiness towards immersion, or indeed an outright fear of it. As our societies become increasingly technologically determined immersion has become a pervasive phenomenon. In the 1990s the notion of immersion merged with discussions on artificiality and the aestheticization of everyday life. Not technology per se, but rather the consumer worlds that it constructs were the focus of this critique of the spectacle and a ›society of immersion‹. Likewise, technology has become conceptualized as a second nature, albeit one that is both internal and external. Subsequently, debates around human-computer-relationships (HCI) returned – although this time with a focus on immersion as a basic human capability.

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