

LEVELS OF SEMIOSIS: THREE KINDS OF KINDS

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Abstract

This paper presents a second-order semiotic framework for ontological levels, which is based on the structure of semiosis in a more fundamental way than other existing approaches to semiotic levels. Building on the key semiotic concept of representation, three levels are posited: (1) non- or proto-semiotic processes, without representation, such as physical or causal processes, (2) semiotic processes, with representation, such as the processes of life and cognition, and (3) second-order semiotic processes, with representation of representation, such as self-conscious and self-reflexive communicative processes. This semiotic framework for ontological levels is compared with recent discussions of different ontological kinds of kinds such as indifferent and interactive kinds. This leads to the distinction between not two, but three kinds of kinds: indifferent, adaptive and reflexive kinds, of which the last two hitherto have not been clearly distinguished.

INTRODUCTION: NATURAL KINDS AND OTHER KINDS OF KINDS

In philosophy there is a long tradition for talking about natural kinds, though there is little agreement on what those kinds exactly are (e.g. Hacking 1991, Cooper 2004, Bird & Tobin 2015). However, there is general agreement that fundamental particles, chemical elements, biological species and such are paradigmatic examples of natural kinds. The discussion of natural kinds is interesting not only in itself, but also because it is linked up with discussions of realism, natural laws, explanations, inductive inference, differences between natural and human sciences, classification, etc.

Ian Hacking (e.g. 1995) has pointed out that ‘human kinds’ (Hacking’s term) are distinctly different from natural kinds, because they exhibit looping effects: classifying and describing human kinds results in feedback which alters the very kinds under study. Human kinds respond to being studied in ways that natural kinds don’t.

For our purpose here, Hackings discussion of natural and human kinds is relevant in two ways: First of all by presenting the idea of different kinds of kinds in a striking manner, and second by pointing out the looping effects of human kinds – an idea that calls for a semiotic approach. Hacking later changed his terminology to talk of the distinction between indifferent kinds and interactive kinds (Hacking 1999: 103ff), and we will refer to these terms in the following.

Indifferent and interactive kinds are kinds of kinds, not kinds of things or phenomena. In other words, the ‘interactive’ is a way of characterising classifications, such as “hyperactive children”, sorts of

suicide and sorts of sexuality: “because kinds can interact with what is classified, the classification itself may be modified or replaced” (Hacking 1999: 103). Hacking is particularly interested in how new classifications of human beings come into existence and how such classifications affect those who are classified by them. And he considers his work a contribution to the “study of making up people”.

Hacking and many of his commentators (e.g. Cooper 2004, Lambert 2006) draw the distinction between natural and human kinds – as the primary and only distinction between kinds of kinds – precisely there, between nature and human. Muhammad Ali Khalidi (2010), however, challenges this and argues that interactive kinds are not only human or social kinds. The philosophically distinct and significant ability to loop back and influence ‘its own’ classification is not confined to the human or social realm. Awareness and intentional action are not required for interactivity and the looping effect. Khalidi argues that newly invented kinds of chemical compounds, dogs as domesticated wolves and genetically engineered biological species are examples of interactive kinds, though he finds that biological species and human kinds are more strongly interactive than chemical compounds.

It seems there is a distinction to be made between human kinds, as they are characterised by Hacking, and interactive kinds in a broader sense, but the concept of interactive kinds conflates this distinction. The philosophical discussion of kinds of kinds thus points out very important issues, but there is no clarification in sight as to what the main kinds of kinds are and why these are the main kinds.

In this paper I argue that a clarification of the idea of different kinds of kinds is better sought through a semiotic approach. I identify three basic ontological levels, which I characterise as zeroth-, first- and second-order semiosis based on theories of biosemiotics, second-order cybernetics and relational metaphysics. Then I compare this second-order semiotic framework to other approaches to ontological levels, and substantiate the claim in relation to evolutionary history. Finally I describe the implications of this framework for the discussion of kinds of kinds.

The discussions of kinds of kinds in relation to Hackings work clearly have implications for the issues of realism versus constructivism and the role of ontology. It is not possible here to go into these issues in any detail, but it is necessary to sketch the position taken here. Semiotics and in particular biosemiotics are essentially (radical) constructivist (see e.g. Alrøe & Noe 2012, Nöth 2001, 2011). This does not mean that semiotics has no use for a metaphysical or ontological foundation, but that this foundation must always have the form of a “working ontology” that is fallible and open to revision like all scientific knowledge. Such foundational “working ontologies” are indispensable and must be discussed just as intensely as realists discuss “reality”. It is in this spirit that I talk of ontological kinds and ontological levels.

SEMIOTIC KINDS OF KINDS

Within semiotics there have been several attempts to address questions regarding semiotic levels or types of semiosis that are analogues to the kinds of kinds outlined above, and the questions are considered just as important. Kalevi Kull, Claus Emmeche and Donald Favareau (2008) thus pose questions about “the boundary levels of biosemiosis” and “what the main types and levels of semiosis are” in their series of questions that any worthwhile semiotic study of life should ask.

Given the great number of semiotic levels that have been suggested and discussed (see e.g. Nöth 2001, Stjernfelt 2003, Kull 2009), one may wonder why I think there is a need for yet another set of semiotic

levels. One argument is empirical. The basic semiotic thresholds and levels should correspond to our empirical findings about the world (acknowledging that these findings are not independent of the classificatory schemes used in making them), and I have not found suggestions for basic kinds of kinds and ontological levels that I find empirically adequate. Another argument is that I believe a theoretically and philosophically satisfactory account of kinds of kinds, world levels and evolutionary thresholds has not yet been given.

Umberto Eco (1976) introduced the term semiotic threshold for the natural boundary between the semiotic and non-semiotic world, which he considered to coincide with the distinction between human culture and nature. Later semiotic threshold has been generally used as a concept for the border between levels or types of semiosis such as Terrence Deacon's (1997) use of symbolic threshold to differentiate between the human-specific (symbolic) and other (iconic and indexical) sign systems. Kull (2009) further elaborates these ideas into a theory of semiotic threshold zones, with a primary threshold zone (in line with Eco's distinction) between semiosic and non-semiosic systems, and secondary threshold zones that separate the vegetative and animal semiosis (at the indexical threshold zone), and animal and cultural semiosis (at the symbolic threshold zone).

The three semiotic levels that I suggest here as zeroth-, first- and second-order semiosis, correspond roughly to the two major thresholds of life and human culture. The interesting is in the why and how.

In a longer discussion of the semiotic 'missing link' and the distinction of man from animal, Frederik Stjernfelt (2007: 243ff) argues against Deacon's symbolic threshold because the Peircean notion of symbol can be found widespread in higher animals. Symbols refer to their object by means of habit, and the ontogenetic ability to make habits in form of learning is found in higher animals. For instance, simple Pavlovian conditioning is a symbol in Peirce's terminology. Instead Stjernfelt proposes that Peirce's notion of 'hypostatic abstraction' (i.e. making a predicate, such as 'hard', into an object, such as 'hardness', that can be subjected to further investigation) is a more specific form of symbol that distinguishes (most) men from (most) animals. In other words, it takes thought as a thing in a recursive operation that may produce an unlimited hierarchy of ever more abstract notions. Hypostatic abstraction is a crucial element in the reasoning process that seems only to be found in man; man is the abstract animal: "... abstraction adds the possibility for the construction of the enormous subdomains of discourse involving counterfactual universes: myth, religion, literature, science whose vast capacity for general truths mirrors an equally large capacity for general fallacies." (Stjernfelt 2007: 255)

I agree that there is a main threshold to be found here and that the important question is not the distinction of man from animal, but the characterisation of the specific semiotic ability that gives rise to the explosion of distinct features found in human culture. The point being that this ability is not found throughout man as a species, but in persons (the importance of this distinction is well known in ethics, see e.g. Alrøe & Kristensen 2003), and that it is not restricted to man, but also found in social systems and, eventually, in computer-based systems. I agree with Stjernfelt that symbolic signs as such are not the proper distinguishing feature of human culture, but I am not sure his alternative, hypostatic abstraction, is sufficiently general to characterise this basic semiotic threshold.

Interestingly, Stjernfelt (2001) in a footnote speculates that the representation of consciousness could play a special role in hypostatic abstraction as a form of representation that especially enables the fast and effective treatment of hypostatic abstractions. For now, I will merely suggest what I think is a

more general framework for the two basic semiotic thresholds, and leave the relation to hypostatic abstraction for further investigation.

Stjernfelt (2003, 2007: 271ff) furthermore points out a whole range of suggested and implied semiotic thresholds that specify where the border between the semiotic and non-semiotic world can be found and where the borders are between main types or levels of semiosis. Two major ideas of the lower threshold of semiosis are Thomas Sebeok's idea that the boundaries of life coincide with the boundaries of semiosis and Peirce's idea that the whole universe consists of signs.

Winfried Nöth (2001) considers the lower semiotic threshold between the organic and the inorganic world and whether the inorganic world harbours genuine semiosis or merely quasi-semiosis. Peirce's universal theory of signs is sometimes called pansemiotic, but to be more precise Peircean semiosis presupposes thirdness, and the world also consists of firstness and secondness, which may be considered quasi-semiotic in light of Peirce's theory of continuity (Nöth 2001). This conception is consistent with the idea of semiotic levels that I present here. From my point of view the basic ontological levels are semiotic – they are determined by the nature of semiosis.

SECOND-ORDER SEMIOSIS AND THE THREE SEMIOTIC LEVELS

The semiotic levels presented here, as a 'working ontology', are based on the structure of semiosis like the suggestions discussed above, but in a different and, I believe, more fundamental way. Building on the key semiotic concept of representation, three ontological levels are posited:

- (0) non- or protosemiotic processes, without representation
 - zeroth-order semiosis
 - physical or causal processes
- (1) semiotic processes, with representation as the key form of relation
 - first-order semiosis
 - processes of life and cognition
- (2) second-order semiotic processes, with representation of representation
 - second-order semiosis
 - self-conscious and self-reflexive communicative processes

The three levels are characterised by the different types of relations and processes found there, and not primarily by objects or entities (in line with Kull 2009: 15). The importance of this semiotic framework for understanding the major ontological levels is not so much in where the boundaries or thresholds are (though many other thresholds have been suggested) as in the way they are determined.

The three levels are based on the foundational character of semiosis and signs, representation. According to Peirce a sign (a representamen) is something that stands to somebody (an interpretant) for something (an object) in some respect or capacity. This 'standing to for' is representation.

The middle level is called Level 1, because this is the common level of semiosis as it is usually studied in organisms, cognition, etc., characterised by autonomous systems that represent their phenomenal world, or *Umwelt* (cf. Uexküll 2010). This is the territory of biosemiotics, and absolutely uncontroversial here.

The top level, Level 2, is from where the framework takes its name as a second-order semiotic framework. This level consists of relations that can be characterised as representations of representations or second-order semiosis. Here we find the basis for concepts such as self-consciousness (as compared to plain consciousness as a term for the ongoing process of semiosis in an organism) and self-awareness. The concept of self depends on the ability to grasp oneself as a semiotic, observing and reasoning being, that is, to represent this representational character.

The inspiration for the second-order character comes from second-order cybernetics in the tradition of Heinz von Foerster (1981, 2003) and Niklas Luhmann (e.g. 1995). Especially the comprehensive work of Luhmann has shown the importance and strength of working with second-order concepts in characterising the communicative systems of human society.

A consequence of the second-order semiotic framework is that much of what has in the tradition of Umberto Eco and other 'human-centred' semioticians plainly been called semiotics, is here considered second-order semiotic: a semiotic that exhibits a self-reflexive awareness that what is represented is itself representations. This is the semiotic of language, discourses, literature, etc.

The bottom level is called Level 0 because it is characterised by zeroth-order semiosis. I use the term zeroth-order semiosis, because while there is obviously no way of observing this level except by means of semiosis (with what follows in form of perspectival contextuality and complementarity), what is represented at Level 0 is not semiosis, or at least not genuine semiosis (which includes an interpretant) as discussed above. Zeroth-order semiosis is the level of semiosis necessarily alluded to in first-order semiosis, in form of the dynamical object referred to, even though it is not a genuinely semiotic level. If there is no reference, however feeble, to a "dynamical object, or really efficient but not immediately present object," as Peirce puts it, there is no genuinely semiotic relation (and, in line with Peirce, not ruling out that the object may be fictive, hypothetical or ideal).

RELATION TO OTHER SEMIOTIC THRESHOLDS

The first threshold is similar to the threshold promoted by Thomas Sebeok (cf. Kull 2003), which states that life is semiosis. But here the defining characteristic is the semiotic ability of forming representational relations, and this means Level 1 includes not only living organisms, but (actually in line with Sebeok, cf. Ziemke & Sharkey 2001: note 2) also computers, robots, etc. (see e.g. Nöth 2001, . Ziemke & Sharkey 2001).

The second threshold provides a different take than the other semiotic approaches to levels discussed above, characterising the threshold as based on the emergence of second-order semiosis, enabling the representation of representation. While there have been no shortage through history on approached that separate humans from the rest of nature as a special kind of being, most of these distinctions are problematic. For example, in ethics, the decisive distinction is not between man and animal though this is often presumed in anthropocentric ethics, but between persons and non-persons because the faculty of self-awareness is key to moral responsibility (see e.g. Alrøe & Kristensen 2003). Stjernfelt (2003) does actually mention a semiotic threshold that comes close to what we suggest here, namely self-consciousness, but he does not state an author of the idea. Søren Brier (2008: 395-400) also operates with self-consciousness as a characteristic of the top level, but in a rather more complicated model of cybersemiotics.

The second-order semiotic threshold is thus different from thresholds that indicate an essential difference between man and animal and point at symbols or culture as distinctively human phenomena. The threshold does not include all that is human, nor does it preclude that first instances of second-order semiosis may appear in animals, or in computer systems.

RELATION TO OTHER ACCOUNTS OF ONTOLOGICAL LEVELS

This semiotic account of the basic ontological levels is partly in agreement with a suggestion of ontological levels coming from discussions of reduction and emergence in philosophy of science. Claus Emmeche, Simo Køppe and Frederik Stjernfelt (1997) identify, as a working hypothesis, four primary ontological levels, the physical, the biological, the psychological and the sociological. The first threshold is the emergence of life, which, following Sebeok, is the threshold to genuine semiosis. At the second threshold, two interwoven levels emerge in parallel, the psychological and the sociological. The psychological is defined by the emergence of self-consciousness, the primary entity at the psychological level. The primary entity defining the sociological level is the institution. My suggestion is largely in agreement with the first three levels with the emergence of life and self-consciousness as primary characteristics, and gives a semiotic explanation of these three levels, whereas the sociological level is not considered an ontological level in this framework.

There is no space here to elaborate on the place of the social in the suggested semiotic theory of levels. But in outline I consider the social not as a separate level but as a systems phenomenon. Each semiotic level is characterised by a certain type of relations, causal relations, semiotic relations and second-order semiotic relations, and each type of relations give rise to certain kinds of systems, such as physical systems, ecosystems and social systems, at the three levels. What is today considered ecosystems incorporates physical as well as semiotic processes, but in the present perspective ecosystems are to be distinguished by their reliance on semiosis. Biosemiotics shows many steps toward a general semiotic theory of ecological systems, and Niklas Luhmann (e.g. 1995) has elaborated a comprehensive theory of social systems as systems of communication, which is not based on semiotics, but on meaning and second-order cybernetics. Efforts have also been made to work out a unified theory of semiotic systems, such as Søren Brier's (2008) cybersemiotics. Maybe the framework of semiotic levels suggested here can help in this direction by suggesting that Level 1 systems consist of mutual representational relations, while Level 2 systems consists of mutual second-order representational relations – that is, relations that build on representing the other as capable of representing representations and, thereby, capable of lying and representing the other as lying. It is thus second-order semiosis and not semiosis per se, contrary to Eco (1976), that is characterised by the possibility of lying.

SUBSTANTIATING THE CLAIM

In this conference paper, I can only do little to substantiate the claim that these are the proper basic semiotic levels. For what it is worth, I have been thinking in terms of these three ontological levels since I developed the idea in a lively internet discussion group on the philosophy of Robert M. Pirsig in the late 1990s (cf. Glover 2003: 59, 196, 411), and I have since found the framework consistently fruitful and adequate for both my theoretical and empirical work. Some of the theoretical clarification that I think this framework offers has been outlined above in the comparisons with other approaches. Further down I will suggest how the framework can provide some clarification in relation to the 'kinds

of kinds' discussions that I described in the introduction. Apart from this I will briefly describe how the framework accounts for the major shifts in evolutionary history.

EVOLUTIONARY ACCELERATION

A major testbed for ontological thresholds and levels is how they account for the evolutionary histories as we know them from natural and cultural history. Unfortunately those evolutionary histories are not independent of the categorical frameworks we use to investigate them, but that is the conditions of science.

If we look at the overall picture, I will argue that the evolutionary history we know exhibits two explosions, the explosion of life and the explosion of human culture, and that each explosion corresponds to the emergence of a new ontological level of complexity. By explosion I mean both a qualitative shift in complexity, to representational relations and second-order representational relations, and a shift in the pace or timescale of evolution enabled by the shift in complexity. Biological evolution takes place on a different timescale than cosmological or physical evolution (though it is difficult to apply the concept of timescale to the origin of the universe), and the evolution of human culture takes place on a different timescale than biological evolution.

Within biological evolution there are also secondary explosions, such as the Cambrian explosion of multicellular organisms. I would argue that such secondary explosions are the consequence of a 'social' or 'systems' evolution based on the available type of relations. Causal processes on Level 0 form the basis for differentiation of elements and systems evolution in form of galaxies, stars and planetary systems. Semiotic processes on Level 1 form the basis for functional differentiation of living entities on the basis of mutual representational relations and systems evolution in form of ecosystems and complex organisms. Second-order semiotic processes at Level 2 form the basis for functional differentiation and evolution of communicative social systems as described in the theory of Luhmann (1995).

Life is no longer the only medium of semiosis. Human technology provides a medium for semiosis that develops at a much more rapid pace than natural and cultural evolution. The second-order semiotic framework would predict that a qualitative shift in computer-based semiosis will happen at the threshold where the representation of representations is enabled. As yet, the focus has been elsewhere in the development of artificial intelligence.

IMPLICATIONS FOR THE 'KINDS OF KINDS' DISCUSSION

In relation to the discussion of different kinds of kinds in philosophy, which I described in the Introduction, the second-order semiotic framework has at least two major implications. Firstly, the framework suggests that there are three basic kinds of kinds, which we can characterise as indifferent, adaptive and reflexive kinds, dividing the contested notion of interactive kinds into two, adaptive and reflexive, based on the characteristics of the semiotic levels. That the world consists of indifferent kinds seems to be the default assumption in most natural sciences, but also, surprisingly, in many social and human sciences. It was this situation that Hacking reacted to. But at Level 1, the level of semiosis, scientific and other observers must be prepared for adaptive kinds. A single example is that of resistant pathogens. For a long while after the discovery of antibiotics medical science has acted like bacteria and other pathogens were indifferent kinds. In fact this seems still to permeate the use of

medicine in some veterinary and medical practices. But pathogens are adaptive kinds, and in step with the recognition that new antibiotics are hard to come by, it becomes more and more clear that the growing problems of resistant pathogens is not only a problem of inappropriate medical practice, but also a problem of inappropriate science that treats adaptive kinds as indifferent kinds. At level 2, the level of self-reflexive semiosis, Hacking (1995, 1999) has provided a number of examples of how the research objects of science, such as the persons involved with 'hyperactive children', potential suicidal persons and persons of different sexual orientations, observe the scientific results and methods, and that these reflexive kinds change their practices as a consequence of those observations. Sciences that operate at Level 1 and 2 must always prepare for the autonomy connected with semiosis (expressed in form of the interpretant). Observations and experiments at these ontological levels must take the possible consequences of the autonomy of adaptive and reflexive kinds of kinds into account.

Secondly, in relation to the issues at stake in the philosophical discussion of kinds of kinds, it seems appropriate to distinguish between the metaphysical question of the character and number of ontological levels and the kinds of kinds this gives rise to, and an epistemological, philosophy of science question on the necessary relation between the observed and the observer. The relation between the scientific perspective and the research object is different in different kinds of science. Many kinds of science can be characterised as what I call "systemic" sciences (Alrøe & Kristensen 2002). A systemic science is a science that influences its own subject area. Agricultural science is a systemic science because agriculture is an area in rapid development and agricultural research plays an influential role in this development. Other systemic sciences are health science, environmental science, engineering and technological sciences such as biotechnology and information technology, economics and political and social sciences, (notably) philosophy of science and social studies of science, and even some of the physical sciences such as condensed matter physics. Some of the issues discussed by Khalidi (2010) in terms of interactive kinds, such as the production of new chemical compounds, are in fact issues that should be discussed in form of the interaction of scientific perspectives with their research object, using notions such as systemic science and reflexive objectivity (which concerns the influence of the cognitive context, see Alrøe & Kristensen 2002). This a potential issue across all three semiotic levels.

CONCLUSIONS

The presented framework suggests that there are exactly three basic ontological levels, no more, no less, and that they are semiotic levels distinguished by the type of relations found on each level. The bottom level, Level 0, consists of zeroth-order semiosis in form of physical or causal processes with no element of representation. The middle level, Level 1, consists of first-order semiosis in form of e.g. the processes of life and cognition, which are based on representation. The top level, Level 2, consists of second-order semiosis in form of e.g. the processes of self-consciousness and self-reflexive communicative systems, based on representation of representation. Basic ontological levels, such as the three levels in this second-order semiotic framework, have implications for a range of other concepts and issues, such as agency, communication, meaning, habit, language and culture. As an example of these implications, this paper has elaborated on the implications for the 'kinds of kinds' discussion. The three levels give rise to not two, but three kinds of kinds: indifferent kinds, adaptive kinds, and reflexive kinds, and sciences that operate at Level 1 and 2 must always prepare for the possible reactions of adaptive and reflexive kinds of kinds to the research that investigates them.

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