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Article abstract

Human modelling is unique among the modelling of all the animals because it features both nonverbal and verbal communication. Yet, in the development of this modelling, something must be lost with the movement to one mode from another. Biosemiotics, positing 'semiotic freedom', claims the organism 'builds' on its relation to the environment. This paper will consider the theoretical approaches in biosemiotics which suggest freedom of, repression within and constraints on (in Deacon's sense) organismic action. The paper aims to stimulate discussion regarding which conceptions and terminology are most appropriate in this sphere.

Growth as Constraint

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Introduction

Possibly the foremost characteristic of semiosis is its tendency to grow, to lead to more semiosis. The idea, amplified especially by Eco (1976) and Merrell (1996, 1997), is strongly associated with Peirce and is now integral to biosemiotics. Indeed, many of the insights of biosemiotics involve facilitations, affordances and assists to functionality. Yet, organisms often need to decelerate the growth of semiosis, or repeat parts of it. This is evident in the occurrence of invariants. As Peirce argues, it is the “essential function of a sign to render inefficient relations efficient – not to set them into action, but to establish a habit or general rule whereby they will act...” (CP 8.332). The idea of ‘habit’, too, is central to biosemiotics; but is it sufficient to account for the apparent impediments or blockages to straightforward development of semiosis?

Certainly, the issue of impediments is occasionally overlooked in understandings of culture; invariably, though, there will be plenty of evidence to reveal that one or another cultural phenomenon has not had a smooth trajectory delivering it to its current stage of development. Instead, it will have been subject to overdetermination and uneven development. Arguably, the descriptions of nature (in its breadth outside the small compartment of culture) offered by biosemiotics need to be alive to overdetermination and unevenness, too. In the present article, the focus is on the conceptualisation of impediments to development, some of their consequences and how they are played out in the sphere of nonverbal communication in general.

Use, Darwinism and Repression

In Chapter 3 of *On the Origin of Species*, Darwin writes of the “struggle for existence”, noting that variations, if they are in any way profitable to the individuals of a species “in their infinitely complex relations to other organic beings and to their physical conditions of life” (Darwin 1872 : 49) will tend to preserve those individuals and be inherited by the offspring, giving them a better chance of surviving. This principle is called “natural selection, in order to mark its relation to man’s power of selection” (*ibid.* : 69). In the chapter of *Origin* that follows this statement, Darwin gives an extended definition of “natural selection”, writing :

Let it also be borne in mind how infinitely complex and close-fitting are the mutual relations of all organic beings to each other and to their physical conditions of life; and consequently what infinitely varied diversities of structure might be of use to each being under changing conditions of life. Can it then be thought improbable, seeing that variations useful to man have undoubtedly occurred, that other variations useful in some way to each being in the great and complex battle of life, should occur in the course of many successive generations? (1872 : 62–63)

Darwin is drawing attention, here, to factors of overdetermination. The key point is the complexity of relations in niches or enclaves of organisms and the “physical conditions of life”. Of course, this stress is evidence that Darwin gave due consideration to the manifold nature of the conditions in which organisms exist, in contrast to the popular conception of natural selection as an immutable law. Nevertheless, there is a privileging of the conception of “use” in this statement, enforcing an unquestioned elision from “use” to “survival”. Later, Darwin does try to mitigate that elision when he refers to the bee sting bringing the creature’s own death, to huge numbers of drones being slaughtered by their sterile sisters, the waste of pollen by fir trees and *Ichneumonidae* feeding within the living body of caterpillars. He concludes that “[t]he wonder indeed, is, on the theory of natural selection, that more cases of the want of absolute perfection have not been detected” (1872 : 415).

The privileging of “use” in these statements of Darwin are probably made more important by the fact that the statements seem to be mere qualifications. Such a deployment of “use” has been challenged by Gould & Lewontin (1979) and Gould & Vrba (1982), in articles dedicated to unravelling the important distinction between current utility and historical genesis in evolution. That is to say many biological faculties that are taken to have evolved ‘inevitably’ as adaptations because of their use-value, have actually been local activations – or ‘exaptations’ (Weible 2016) – of faculties for purposes of local convenience. Gould himself (2011 : 197) feels that the jargon around ‘exaptation’ has got out of hand and refers to “intended results and incidental consequences” in evolution. Jargon aside, there remains a distinction of considerable importance because “intended results” in evolutionary theory not only suggests that development to the ‘present state’ was largely inevitable

but that the arising of one biological function automatically led to the arising of another. In short, “use” in evolutionary theory betrays a functionalist perspective.

Some of this functionalism is evident in biosemiotics. However, “use” is even more localised. For Hoffmeyer and Kull’s (2003 : 269) “use”, in the sense in which it is envisaged in an “ecological niche”, is superseded by “use” in the “semiotic niche” where the organism may have more control because it is in a conjunction in which all latently relevant cues have to be correctly interpreted. In a niche an organism does not attend solely to food, comfort and reproduction; instead, it must attend to an array of *signs* that are associated with those desirable entities. So, it is not just the locality that is important in this conception of “use”, but the semiosis which allows “use” to be realized. Within that semiosis, organisms are blessed or cursed by the need to *act*. Hoffmeyer and Kull thus posit a Baldwinian perspective rather than a strictly Darwinian one since “organisms do not passively succumb to the severity of environmental judgment. Instead, they perceive, interpret, and act in the environment in ways that creatively and unpredictable change the whole setting for selection and evolution” (Hoffmeyer & Kull 2003 : 269–270).

Hoffmeyer and Kull’s perspective not only extends the overdetermination that Darwin identified, but also unties the straitjacket constraining the complexity of niches in the Darwinian account. While Darwin binds survival with the principle of natural selection, Hoffmeyer and Kull free it through the agency which a semiotic environment facilitates. But, notwithstanding the latter’s institution of a more agentic organism, neither consider the *quality* of survival. Nor is there a theorising of the nature of, on the one hand, the partiality in accounts of natural selection (Gould, Lewontin and Vrba are in a position to develop this, but do not) and, on the other, circumstantial limits on agency. Put another way, they do not theorise how “unfavourable” conditions might contribute to survival of organisms conceived as possessing agency. It seems that Darwinism, has not envisaged how some things come to fruition and some things are prevented from coming to fruition. To put it yet another way, there is no account of the mechanisms by which, out of two favourable outcomes for survival, one might be allowed to come to fruition in some way while the other might be ‘repressed’. Nor is there a sense in which agency might precipitate one kind of survival rather than another. It is only recently, in fact, that biosemiotics has fine-tuned such a theory.

For the sciences as a whole, as they have risen over the last 400 years and become separated off from the arts and humanities, there has been an acknowledged need to explicate the connections in the architecture of the universe. Yet, this has often meant that a progressive narrative of efficient growth underwrites scientific explanation, a functionalist blindspot in which dead ends and false turnings are not

even contemplated as part of the account. Darwin had nothing to say about the consequences of repression, but another of the “great modern thinkers” whose work is, likewise, by no means unimpeachable, did. In his 1915 paper on repression, Freud invokes the concept of ‘instinct’. He states that an impulse may meet with resistances which seek to render it inoperative. If the impulse comes from an external location it can be countered by flight; but this alternative is not possible with the internal location of an instinct, so the ultimate resistance, for humans at any rate, is *condemnation* based on judgment. The preliminary stage of this process of condemnation is repression, “something between flight and condemnation” (Freud 1984 [1915] : 145). Yet, since satisfaction of an instinct is usually pleasurable, it is difficult to account for the internal stifling of that instinct or the transformation of it into unpleasure. Freud suggests that repression is therefore a matter of competing impulses in which the one that is repressed is, in fact, turned away or kept from consciousness (Freud 1984 [1915] : 147). Irrespective of whether one accepts the entire Freudian cartography of consciousness, his outlining of the terms of repression is nonetheless persuasive. Freud suggests that there is “primal repression”, a first phase in which the “psychical representation” of the instinct is denied. This is followed by “repression proper”, affecting mental derivatives of the repressed representative. Furthermore, the derivatives of the representative are said to each have their own vicissitudes. However, each case of repression is potentially subject to *displacement* and/or *condensation*. In the latter, the repressed idea is a receptacle for multiple causes beyond itself. In the former case, the repressed instinct is merely located to another idea or object – Freud gives the case of an animal phobia (the famous “Wolf Man”, in fact) where repressed feelings in respect of the patient’s father are worked out in relation to fear of wolves. Ultimately, Freud is no more able to say what the derivatives are and what determines specific repressions any more than Darwin is able to give a definitive account of “use”. Both have to concede that specific instances are invariably massively overdetermined.

What is clear, however, is that the act of repression, like anxiety, is semiotic in nature : it contains an “idea” and associations to that idea. The instinctual impulse – about which Freud is sketchy – cannot really be conceived without its semiotic accoutrements. This may be one reason why psychoanalysis, despite having relatively little impact on psychology, has had some contribution to make to socio-cultural thought, implicitly or explicitly. In semiotics, for example, a central – but largely implicit – concept in the work of Ponzio and Petrilli (Petrilli 2005; Petrilli & Ponzio 2005; Ponzio 1993, 2006a, 2006b; Petrilli & Ponzio 1998) is that capitalism, and latterly global communication, has constituted a sustained repression of dialogue, a force blocking the ultimate inescapable demand of the other. Typically, individualism has been the touchstone of this enterprise, but this has been accelerated in late capitalism through the promotion of monologic identity. In short :

one set of impulses and associations advances while another is impeded.

Macro-Analysis and the Repression of Nonverbality

After biosemiotics especially, semiotics in its more contemporary guise consists not so much of micro-analysis, but in the act of stepping back to enable a broader view of how signification is organized in terms of media, modes, genres and species-specific semiosis. Where semiotics used to be of a piece with a more exclusive 'micro' perspective, carrying out close readings and colluding, to an extent, with the academic tendency towards specialism, in more recent years it has fruitfully developed a more 'macro' perspective. A major institutional challenge to macro-semiotics, however, has been the status of one of its key interests, nonverbal communication. Nonverbal communication, even by its very name – all the stuff that is *not* verbal – is almost akin to an outlaw, pushed to the margins of the academy, despite its prevalence as a phenomenon, by the dominance of the study of the verbal. This is not to say that the field of nonverbal communication has been totally repressed. Indeed, it has been sufficiently variegated to have garnered some attention and in recent decades has even managed to fashion a place for itself in the academy (see, for example, Hall & Knapp 2013). In the popular imagination, too, nonverbal communication occupies a prominent position through the unfortunately designated 'body language'. The demotic understanding of 'body language', promoted since the 1970s in business manuals and popular guides (e.g. Fast 1970), is tacitly based on the notion that bodily communication among humans is highly codified and subject to a kind of 'grammar'. Sebeok (2001a) has shown that this assumption is gravely mistaken and argues that, like terminology such as 'the language of flowers', 'ape language' and so forth, the phrase 'body language' is to be avoided. So, not only has nonverbal communication as a focus for academic or popular interest been forced into a liminal position, that liminal position has also had its consequences in terms of repression of biological processes in the human.

By contrast with most extant expositions by specialists, when semioticians refer to nonverbal communication, they are acknowledging the trafficking of signs *within* an organism or *between* two or more organisms (Sebeok 2001a). Already, this definition operates at the level of the organism – of any species. The rise of communication science in the last century has been steadfastly concerned with human communication alone (Cobley & Schulz 2013); animal communication tends to be a concern in the realm of ethology, not communication science. Nevertheless, in humans, bodily communication comprises a number of elements. The most commonly recognized is manual communication or gesture (Kendon 2004). Yet there is also 'kinesics' (Birdwhistell 1970), made up of bodily movement and posture. In addition, there is 'proxemics' (Hall

1966), focused on the orientation, proximity and distance of bodies as a matter of communication. Although there are other, sometimes tactile dimensions, involved in proxemics, kinesics and gesture, their key channel is the optical or the 'visual'. This has not prevented the rise of 'visual culture' approaches in the last 25 years, proceeding to make 'the visual' their domain of study with no conception of the necessary inherence of nonverbality in general within that field (Mirzoeff 1999; cf. Copley 2011). A proper understanding of nonverbality would not be predicated on the repression of certain nonverbal forms; it would need to acknowledge, in human communication, the connectedness of painting, statuary, design, particularly design of the built environment, opera, film, theatre, television and so forth. Beyond the human, it would have to recognize the relation to music, smell, echolocation and, ultimately, endosemiosis.

Finding an integrated discussion of media, nonverbality and the field of the visual is not easy, particularly outside semiotics. One has to return to the classic, largely forgotten, text by Ruesch and Kees : *Nonverbal Communication : Notes on the Visual Perception of Human Relations* (1956). The authors set out their stall immediately, stating that

the theoretical and systematic study of communication has serious limitations, inasmuch as scientific thinking and reporting are dependent upon verbal and digital language systems whereas human interaction, in contrast, is much more related to nonverbal systems of codification. Although most people are familiar with the rules that govern verbal communication – logic, syntax and grammar – few are aware of the principles that apply to nonverbal communication. (1956 : n. p.)

As they argue, much of the history of nonverbal communication has not been geared to the same kind of striving for representation that is characteristic of verbal and digital systems. As far as the visual arts were concerned, literal representation was hardly on the agenda before the Renaissance. Well into the Enlightenment, it was photography that provided the possibility, for the first time, of disseminating information at length nonverbally. Clearly, for Ruesch and Kees, the development of scientific thought on the back of writing and then printing in the Enlightenment, has served to place further emphasis on the verbal/digital incarnation of knowledge, such that scientific knowledge of human communication has remained depressingly scant (1956 : 12). Even with the putative increase of nonverbal semiosis in large amounts, from the arrival of the still photograph through moving pictures through Web 3.0, the idea that "culture is becoming more visual" (e.g. Ibrus 2015) would probably cut no ice with Ruesch and Kees. The problem they identify is, once more, also connected to the way that disciplines and subject areas develop in the academy – through increasing specialisation rather than through macro-analysis.

Sebeok, by contrast, thought in precisely the kind of broad strokes

that characterize true interdisciplinarity. In considering the matter of communication, he effortlessly crosses the boundaries of the humanities and the hard sciences, throwing into relief not only the breadth of semiosis but also the grounds on which semiotic fields may become marginalized or repressed. He outlines the channels for signs or the channels in which communication takes place :

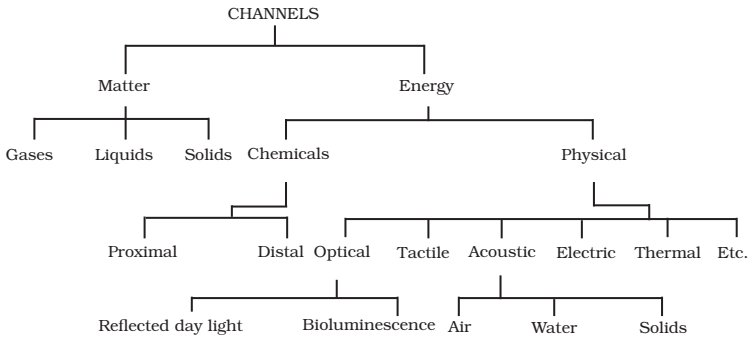


Figure 1 - (Sebeok 1991 : 27)

Any channel – but particularly those which are most common in tertiary modelling systems, to the right of the diagram, are compelled to ask about the *Umwelt* that is being invoked in any study of the products of that channel. Hence, Sebeok also indicates the sources of signs :

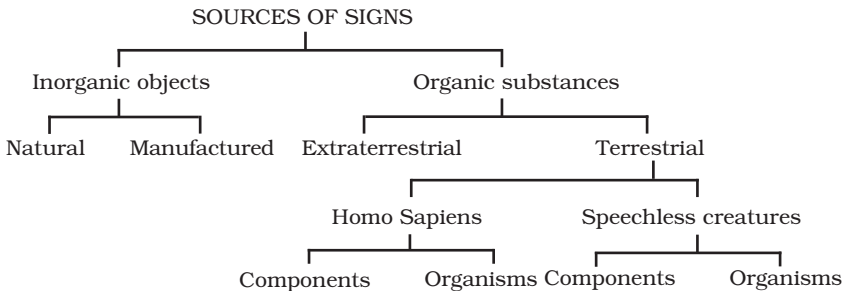


Figure 2 - (Sebeok 1991 : 26)

The clear division here is, first, between organic substances and inorganic objects; then, second, between the speechless creatures and *Homo sapiens*. What unites the latter two, however, is that they com-

municate from organism to organism, but also within organisms. This is not to say that any study of a channel and source must get bogged down in protracted appraisals of adjacent channels and associated sources. However, there is a strong indication here of the way that conceptualizations of phenomena and the institutionalization of those conceptualizations blocks, or even worse *represses*, the way of inquiry.

The clearest example of a natural 'repression' with a major cultural consequence concerns nonverbal communication in human development. Although there has been little work carried out on this process, from the period when toddlers learn words, linking and elementary syntax there is a palpable repression of nonverbal communication. Indeed, this repression is institutionalised at this age by speech therapists and numerous "medical" tests to ensure that children are developing grammar. Where such tests are not administered in a sensible fashion, paying attention to broader achievements in cognition, they can operate as an attempt to 'shake' toddlers out of their non-verbal ways. There has been opposition to, and struggle against, such linguistic imperialism – for example, by the deaf (Maher 1997). However, even this example leans towards a linguistic incarnation of communication while, in general, nonverbal communication in humans – gesture, proxemics, kinesics, music, visual communication of bodily changes – is viewed as a supplement to spoken language.

For an account of the importance of nonverbal communication in the human, its inherence in the field of vision and the repression of it, consider the following reminiscence of the veteran neonate researcher, Daniel Stern. Recalling the birth of his interest in the ontogenesis of human communication, he writes :

When I was two years old, I was hospitalized for many months for an operation that was complicated by an infection. In those days, antibiotics were not yet very effective and hospital stays could be quite lengthy. In addition, visiting for parents and family were fairly limited. At that age, I spoke only a few words and could understand very little of what was being said. But it was important for me to have a sense of what was happening. Like any child in that situation, I tuned into what people did, how they moved, what was happening on their faces and how they said what they said. In other words, I was paying attention to the music but not the lyrics, as these were beyond me. In short, I became a watcher and reader of the nonverbal. A lot depended on it. (1998 : 4)

Apart from the heart-rending nature of this account, in which the poor child is left to his own resources and proves most resourceful, modestly recalling later in respect of the nonverbal that "A lot depended on it", the quote indicates the first repression of nonverbal communication under discussion. The school of denigration of vision and its fellow travellers equate the visual predominantly with photographs and electronic media, entertaining the occasional foray into painting and other art-related practices. What they neglect – preposterously – is that visual technolo-

gies are just one minuscule portion of the entire sensory channel of sighted creatures. Of course, visual technologies can be argued to be extremely important as a crucial political battleground, particularly if they can be proven to influence or shape the way humans see. Yet, to forget that understanding the visual requires stepping back to examine how it functions for all sighted species effectively amounts to a repression of nonverbal communication. What Stern depicts in this quote is a world dominated by nonverbal communication, one in which vision is essential to survival and, tellingly, vision does the job adequately but by no means omnipotently.

In the light of Stern's memory of ontogenesis, Sebeok's (1988) (re) formulation of primary modelling becomes all the more startling. Sebeok shows that what is known about early humans provides some important evidence for such a classification. He summarise knowledge from the then extant archaeological record to show that early hominids (*Homo habilis*, about two million years ago) harboured a 'language', grammar or modelling 'device' in their brains. *Homo erectus* (about one and a half million years ago), with an increased brain size over his/her predecessor, also possessed the capacity, an as yet unrealized ability to develop a sophisticated human verbal communication system. However, verbal encoding and decoding abilities only came into use about 300,000 years ago with early *Homo sapiens*. Two conclusions arise from this. Firstly, if language appeared in humans so early, then it provides grounds for the idea that it is was involved in a long period of co-evolution with the brain – "Languages also have to adapt brains" – as posited by Deacon (2012a : 33; 1997). Secondly, it indicates that humans therefore possessed the capacity for *language* long before they started to implement it through *speech* for the purposes of verbal communication. This was by no means inevitable; rather, verbal *communication* was an *exaptation*. Prior to the verbal form, communication would have taken place by nonverbal means, a means that humans continue to use and refine today (see Sebeok 1986 and 1988). *Homo habilis* and *Homo erectus* therefore appear to have had what Sebeok, following his 1988 adjustment of Lotman's formulations, calls 'primary modelling'. *Homo sapiens sapiens* evolved secondary and (as the inevitable consequence) tertiary modelling or, respectively, speech communication and sophisticated cultural forms. However, a third conclusion is unavoidable.

Freedom and Loss

If the human *Umwelt* can be understood as being derived from an innate 'primary modelling' device by which humans can differentiate the world and use their sensorium in a comprehensive fashion, utilising the zoosemiotic nonverbal and the anthroposemiotic verbal, then it is clear that the failure to fully acknowledge the nonverbal constitutes a lacuna in the understanding of phylogenesis and ontogenesis. In the develop-

ment of secondary modelling, something must be lost with the movement to a pre-dominantly verbal mode from a nonverbal one. In the theory of natural selection, it is clear that what gets lost in the move from one state to another is the species, or species members, who do not adapt fit features to the evolving environmental imperatives. Biosemiotics, on the other hand, has been critical of the ruthless mechanism of the theory of natural selection. Contra neo-Darwinism, it posits 'semiotic freedom' and elements of learning in evolution. For example, Hoffmeyer, refers to experiments where scientists placed artificial sweeteners rather than glucose in the environment of a chemotactic bacteria cell. He writes :

In such cases, it seems appropriate to say that the cell misinterprets the chemical signs of its environment. Such misinterpretations are dangerous, and natural selection will favor any solution that helps the organism to better interpret the situations it meets. Indeed, selection would be expected to favor the evolution of more sophisticated forms of "semiotic freedom" in the sense of an increased capacity for responding to a variety of signs through the formation of (locally) 'meaningful' interpretants. Semiotic freedom (or interpretance) allows a system to 'read' many sorts of 'cues' in the surroundings, and this would normally have beneficial effects on fitness. Thus, from the modest beginnings we saw in chemotactic bacteria the semiotic freedom of organic systems would have tended to increase, and although it has not been easy to prove that any systematic increase in complexity, as this concept has traditionally been defined, has in fact accompanied the evolutionary process, it is quite obvious that semiotic complexity or freedom has indeed attained higher levels in later stages, advanced species of birds and mammals in general being semiotically much more sophisticated than less advanced species. (2010 : 164)

This semiotic freedom characterizes the scaffolding process in evolution, where the organism 'builds' on its relation to the environment. Hoffmeyer's further development of the concept, generalizing it to cover the network of semiotic interactions connecting an organism with its *Umwelt*, shows how it facilitates processes of perception and action. The piecing together of parts of scaffolding produces particular reproducible 'meaning' for an organism as it takes part in the functional cycle of *receiving* signs appropriate to the sensorium and *producing/circulating* sensorium-appropriate signs. As Hoffmeyer explains, the process of scaffolding, traversed by semiotic freedom, contains something akin to a 'goal' :

Allowing for semiotic freedom in the organic world significantly changes the task of explaining emergent evolution, because semiotic freedom has a self-amplifying dynamic. Communicative patterns in assemblies of cells or individuals may often have first appeared as a simple result of the trial-and-error process of normal interaction, and may then endure for considerable periods of time. If such patterns are advantageous to the populations (cells or organisms), they may eventually become scaffolded by later mutational events. Through this 'semi-Baldwinian' mechanism, the evolutionary process will enter a formerly forbidden area of goal-directedness. (*Ibid.*)

Thus, the semiotic freedom of organisms is responsible for its survival,

for its evolution and contributes to changes in its environment.

Yet, such descriptions, in presenting a functional process, often run the risk of overlooking possible impediments or by-products of forward-looking mechanics. What about those occasions when one choice is made over another? Something has to be lost or left behind. Sometimes what is left behind is something that it is beneficial to lose, such as negative memories (Ritchie *et al.* 2015); sometimes leaving something behind has deleterious consequences. The matter has to be considered in biosemiotics because, apart from anything else, it is part of agential action.

Semiotic freedom necessarily involves choice of one course rather than another. In studying such freedom, there must arise occasions when it is necessary to investigate the choices that get rejected (and why), particularly as they may later become choices once more or there may be opportunities for the organism to revisit or relive the moment of choice. In the case of the phylogenetic development of communication, it is clear that the 'choice' – exaptation – of linear speech for human communication was significant. By no means did it eclipse nonverbal communication; nor did it demote nonverbal communication to a subsidiary role in real terms; but it did ensure a bias towards the verbal and a disregard for the nonverbal that effectively banished such communication to a realm that is not conscious in the way that it was for earlier hominid ancestors.

A related fate can be seen with respect to ontogenetic repression of human nonverbality. In infancy, the child is almost solely reliant on nonverbal signs. Its *Umwelt* is attuned to verbal signs and such signs will certainly circulate there; but those same kinds of signs will not yet emanate from the child her/himself. For the infant, as Stern (above) suggests, a lot depends on nonverbal communication. Around 24 months, however, the child with an expected development rate will start to use speech and syntax in an elementary fashion. It is for this reason that the testing of children's development that has been mentioned usually takes place: in Europe, this principally takes place through the public health system. The results of such tests may enable a decision to make an early intervention in those cases where the child is not developing as expected, indicating, through this symptom, auditory or cognitive problems. Such tests administered around 24 months were geared to literacy, grammar and syntax in the UK although, with the integration of the health and early years review after 2015, they became slightly more extensive (NHS). What are not tested are skills in colouring (although there is some assessment of elementary drawing), gesturing (besides pointing), singing, sense of body space, rhythm, powers of mimicry, etc. The unpredictable nature of young children's behavior and attention will mean that at least one of these skills will invariably manifest itself even in the controlled circumstances of the test. Yet, such skills are not the focus of the test or taken as indicative of cognitive potential.

Aside from any role that they might have in blunt assessments of efficiency, what child development tests are likely to overlook is that nonverbal communication is frequently pleasurable. This is evident in that nonverbal communication plays such a prominent role in the performances of magicians, in music, in the feats of “intelligent” animals (e.g. Clever Hans), in the exercise of vision (Cobley 2011) and in rudimentary reasoning – abduction (Peirce 1929; Sebeok and Umiker-Sebeok 1980). Each involves a confrontation with repression and each, at least momentarily, involves an unblocking of the human potential that has been left as residual by the choice of the path of verbiage. To be sure, repression is not simply a matter of blocking pleasure for the sake of it; much repression allows human communion to take place and society to be feasible – this is the position of the later Freud, in fact, in works such as *Civilization and Its Discontents* (Freud 1985 [1930]), although his gloomy prognostications in this respect are not final. The matter at hand concerns repression of “bad”, unpleasurable things, as well as “good”, pleasurable ones. Some kind of repression has to be considered in biosemiotics because it is part of agentive action. Semiotic freedom necessarily involves choice of one course rather than another.

So, it is important to consider whether this kind of repression operates at a level of semiotic freedom which has developed only in the human, or whether there is repression at the level of lower organisms. Certainly, the degree of semiotic freedom available to organisms is proportional to what is left over, courses that are not chosen, actions that do not come to fruition. Yet, the question remains regarding which organisms enact repression as described above. One clue might be offered by Peirce and one of Sebeok’s footnotes. Sebeok (2001b : 96) asks whether the one-way ethological implication among the three categories of “taming/training/domestication” might be analogous to the Peircean categories of Firstness/Secondness/Thirdness and whether these map onto Charles Morris’s programme for linguistics, syntactics/semantics/pragmatics. The suggestion in the present discussion – which turns out to be completely unoriginal – is that repression of instincts is required for animals to become domesticated. What is slightly more original is the idea that repression is somehow involved in Thirdness. Interpretants, as Thirdnesses, produce some new signs and not others; rhemes efface their origins in qualisigns; induction belies its abduction roots; the pragmatics of communication encourages some interpretations or perlocutions and not others. Thirdness, or the movement towards Thirdness, seems to harbour repression as an indigenous component. Yet, there is a need to be clear about what is an occlusion and what is a nesting. In the Peircean scheme, indices, for example, are not really occluded; they are nested in symbols. The phytosemiotic world is enclosed in the world of the zoosemiotic, just as both are enveloped in the anthroposemiotic realm, albeit with the added component of language and observership (von Uexküll 1983). With respect to the processes of

repression and exaptation, biosemiotics perhaps offers an alternative perspective on what occurs in the case of the nonverbal residues of communication in language.

Constraint

Any definition of semiosis that portrayed it as solely the action of codes would constitute a serious misconstrual. Even if that definition was toned down to present semiosis as dominated by invariance in signification, it would still be very inaccurate. Although it is worth noting that there is much success in the operation of semiosis – both in nature and its human compartment, culture – the process is riven with fallibility. If there was not success, of course, then the survival of life forms would be in jeopardy. However, while semiosis involves codes, semiosis does not amount to codes, even though invariants in semiosis can be made to work for the possible ends of *Umwelt* functioning and enhancement. Fallibility is part and parcel of the action of semiosis. What semiosis often entails is not the efficiency of the strongest of coding which would lead to identical reproduction. In fact, much of semiosis is concerned with local rather than global interpretations and can involve imperfect recognition, memory, categorization, mimicry, learning and communication (Kull 2007 : 2).

Beyond organic semiosis, similar fallibility can be observed. Far from proceeding with absolutely predictable results, seemingly mechanical processes betray their incomplete properties. Deacon (2012b : 104-7) gives the example of a computer that crashes because its current function is in a loop, engaged in an interminable machine process. The common response to this problem is for the user to turn the computer off and then on again. He notes :

If interference from outside the system (*i.e.*, outside the mechanistic idealization that has been assigned a given computational interpretation) is capable of changing the very ground of computation, then computation cannot be a property that is intrinsic to anything. (2012a : 104)

Thus, it can be concluded that computation is also an idealization about cognition based on an idealization about physical processes. The extrinsic, simplifying constraints – switching on and off – with respect to the computer's mechanical operations are determined in the context of operations that are prevented or otherwise not realized. As Deacon (2012b : 105) adds, "Paying attention to what is not occurring is the key to a way out of this conceptual prison". What establishes these constraints? The obvious answer is "the human brain"; but, as Deacon observes, this merely "passes the explanatory buck", only for it to get passed again to 'evolution' and 'natural selection'. What needs to be accepted is that real world physics and chemistry do not simply act mechanically like a computer with the occasional bug but, in fact, the kind of noisiness and messiness implied by a bug characterises their

operations as a whole. In Deacon's terms, the messiness is not just consonant with the second law of thermodynamics but is a matter of the 'ententionality' (incompleteness) with respect to which phenomena are organized for achievement of something that is not intrinsic to them.

The concept of 'constraints' is of some considerable importance to Deacon's account of ententionality in nature because, as he concludes (2012b : 538), "Mind didn't exactly emerge from matter, but from constraints on matter". Leaving that somewhat large and thorny issue aside, the concept of constraint has implications both for biosemiotics and culture. As Deacon suggests (2012b : 191-2), constraint "is a complementary concept to order, habit, and organization because it determines a similarity class by exclusion". What is important here is that

the concept of constraint does not treat organization as though it is something added to a process or to an ensemble of elements. It is not something over and above these constituents and their relationships to one another. And yet it neither demotes organization to mere descriptive status nor does it confuse organization with the specifics of the components and their particular singular relationships to one another. Constraints are what is not there but could have been, irrespective of whether this is registered by any act of observation. (2012b : 192)

As Peirce held for habits, regularity or organization – rather than any specific substrate – is most relevant in respect of causation. "The term *constraint*", writes Deacon (2012b : 193), "thus denotes the property of being restricted or being less variable than possible, all other things being equal, and irrespective of why it is restricted".

As examples of constraints, Deacon offers the way a fast flowing stream forms stable eddies round a rock and how a snowflake grows hexagonally symmetric but idiosyncratic branches. In growing, the branches of the snowflake "progressively restrict where new growth can take place." (Deacon 2011); in this way, "Constraints reflect what is not there, and the more constrained something is, the more symmetric and regular it is" (*ibid.*). The same principle also applies in the formula for making a perfect bagel : first, take a hole... However, the idea of constraints is certainly more nuanced than bagel recipes and offers a richer picture of invariance than codes or habits allow. It also seems to recast what has thus far been discussed in relation to repression. Rather than an 'information theory' version of 'constraint', what Deacon proposes is an invariant with a capacity for recreating its "capacity for self-creation". In this formulation, "self" is not that far away from Sebeok's (1979) notion of the self. For Sebeok, the self arises at the level of the cell and its immune response distinguishing it from alien entities; for Deacon, the self entails "an intrinsic tendency to maintain a distinctive integrity against the ravages of increasing entropy as well as disturbances imposed by the surroundings" (2011). Ultimately, Deacon posits dynamical reflexivity and constraint as characterising a teleodynamic system (2012b : 510). Yet the "constraint-preservation process" sheds light on the role

of invariance in agency in general, for it is “the simplest exemplar of an intrinsically end-directed process, whose most fundamental end is maintenance of itself” (2011). Constraints are not necessarily to be conflated with order, although the ideas are related; Deacon explains :

As in the case of the messiness of a room, order is commonly defined relative to the expectations and aesthetics of an observer. In contrast, constraint can be objectively and unambiguously assessed. That said, order and constraint are intrinsically related concepts. Irrespective of specific observer preferences, something will tend to be assessed as being more orderly if it reflects more constraint. We tend to describe things as more ordered if they are more predictable, more symmetric, more correlated, and thus more redundant in some features. To the extent that constraint is reduced variety, there will be more redundancy in attributes. This is the case with respect to any change : when some process is more constrained in some finite variety of values of its parameters or in the number of dimensions in which it can vary, its configurations, states, and paths of change will more often be ‘near’ previous ones in the space of possibilities, even if there is never exact repetition. (2012b : 195)

It is for this reason that Deacon suggests that the concept of constraint could supplant habit :

Recasting the Realism/Nominalism debate in terms of dynamics and constraints eliminates the need to refer to both abstract generals, like organization, and simple particular objects or events lacking in organization. Both are simplifications due to our representation of things, not things in themselves. What exist are processes of change, constraints exhibited by those processes, and the statistical smoothing and the attractors (dynamical regularities that form due to self-organizing processes) that embody the options left by these constraints. (*ibid.*)

As he repeatedly states, decisively, the crucial issue concerns what is “not there”.

In light of what has been discussed in the foregoing with respect to repression in the sphere of nonverbal semiosis of humans, there is, perhaps, a need to revise the estimation of the action in question. “Repression” seems to suggest the smothering of some entity that needs to be free. It is an intimation that there is some anarcho-libertarian hinterland that might be reached if repression were lifted. If this is found to be unsatisfactory, an alternative explanatory principle needs to be critical in avoiding a functionalist bearing that would restrict it to the paradigm of scientific explication. The idea of constraint seems to fit that alternative bill. On the one hand, it does appear to explain only ‘successful’ processes :

And it is ultimately the production and propagation of constraints that make physical work possible. For example, containing the expanding gases in an internal combustion engine, and thus constraining expansion to occur in only one direction, allows this release of energy

to be harnessed to do work on other systems, such as propelling the vehicle which contains the engine up a steep incline. So to argue that constraint is critical to causal explanation does not in any way advocate some mystical notion of causality. (Deacon 2012b : 203)

Yet, on the other hand, to this statement is added a critical coda which accounts not just for 'what is there' but the nature of the trade-off regarding what is lost : "We can restate this causal logic as follows : reduction of options for change in one process can lead to even greater reduction of options in another process that in some way depends on the first" (*ibid.*). As with the snowflake and the messy room, greater regularity has its costs.

Conclusion

Although some of biosemiotics' key concepts – such as agency, interpretance and semiotic freedom – have been established only with a struggle and without, by any means, being accepted by mainstream, policy-leading and endowed science, nevertheless they have been relatively easy concepts to accept as efficacious across different domains of nature. In the case of the more troublesome concepts indicating impediments, stunting of growth and retardation, it is more difficult to arrive at a consensus. 'Habit', on the one hand, has enjoyed relatively good fortune, seemingly because of the latitude of the term from its inception with Peirce. 'Code', on the other, has been problematic, largely because of its overtones of rigidity and its embroilment in information theory models against whose mechanistic tendencies biosemiotics is forced to pit itself. 'Constraint', however, may yet prove to be congenial and have longevity. Not only is the concept signified by an existing English term which captures a small amount of its flavour (as is the case with 'habit'), it also subtly adjusts the increasingly commonplace idea that 'signs grow'. Considering the concept of 'constraint', signs not only grow but they do so in highly specific ways which, while not predetermined, are such that one outcome rather than another one will be reached. For organisms with an advanced *Umwelt* that allows knowledge of signs and observer-ship, cognizance of the operation of constraints in any sign system is the key to avoiding an overwhelming sense of inevitability. This applies to examples as seemingly diverse as the clash of civilizations, the end of history, populist politics and the triumph of machines over humans.

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Abstract

Human modelling is unique among the modelling of all the animals because it features both nonverbal and verbal communication. Yet, in the development of this modelling, something must be lost with the movement to one mode from another. Biosemiotics, positing 'semiotic freedom', claims the organism 'builds' on its relation to the environment. This paper will consider the theoretical approaches in biosemiotics which suggest freedom of, repression within and constraints on (in Deacon's sense) organismic action. The paper aims to stimulate discussion regarding which conceptions and terminology are most appropriate in this sphere.

Keywords : Semiotics; Biosemiotics; Code; Constraint; Habit; Semiosis; Repression; Nonverbal Communication; Hoffmeyer; Kull; Deacon.

Résumé

Les capacités modélisatrices des humains sont uniques dans le règne animal

puisqu'elles conjuguent de la communication verbale et non-verbale. Cependant, dans le développement de cette modélisation, quelque chose doit être perdu dans le mouvement d'un mode à un autre. La biosémiotique, qui postule une "liberté sémiotique", soutient que l'organisme se construit en relation avec l'environnement. Cet article considère les approches théoriques en biosémiotique qui concernent la liberté d'action de l'organisme, ainsi que la répression et les contraintes au sein de cette action. Cet article vise à stimuler la discussion afin de déterminer quelles conceptions et quelle terminologie sont les plus appropriées dans ce domaine.

Mots-clés : Sémiotique; biosémiotique; code; contrainte; habitude; sémiose; répression; communication non verbale; Hoffmeyer; Kull; Deacon.

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