Cybersemiotic Medicine: A Framework for an Interdisciplinary Medicine

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Today’s dominant paradigm of modern medicine, which is based on a biomechanical conception of the human, is not efficient and the need for an alternative multi and trans-disciplinary approach is sensed.

For this purpose, although Cybernetics and systems theory can fruitfully explain how self-organization occurs, they do not have a theory of signification. Biosemiotics is a good candidate for the development of such a theory and it seems rational to try to integrate it with cybernetics and with systems theory in order to have all of these in the same framework. This is what Søren Brier (2008) attempts in his book Cybersemiotics.

Søren Brier’s cybersemiotic model of consciousness and cognition is a combination of the Luhmannian triple autopoiesis model, second-order cybernetics and Peircian biosemiotics.

This model is compatible with new views about health, disease and illness in which changes in the health status of a person can be the result of upward and downward effects of changes in hierarchy within the human being. This model is also compatible with the fact that each culture defines its own illnesses and thereby its own medicine; and considering this fact, and using semiotic anthropology, we can create spaces for integrating effective culture based medicines like acupuncture in a comprehensive framework of integrative medicine.

Part One: Why a New Model?: Inadequacies of the Current Approach

As Carlson explains in his history of approaches in medicine, before 1921, when the famous Flexner’s report was published in America as an outline for the modern medicine paradigm, different paradigms of practice were used in the treatment of patients and there was a competition between these methods. But after that, other methods (for example homeopathic treatments) were suppressed (Carlson, 1979, p. 466).

Then around three decades ago, George Engel proposed his biopsychosocial model for management of diseases (Engel, 1980). His model was based on general systems theory and in it he explained that for a comprehensive treatment of a disease, we should consider different effects of disease on different aspects of human life. In his clinical example he showed how a somatic disease (myocardial infarction) can change not only human functioning at the bodily level, but also its functioning at social and psychological levels. Thus he concluded that we need a new view in medicine which would able to cover all levels of people’s life. Contemporary with Engel’s criticism, there were numerous discussions about the need for a holistic view

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in medicine (Carlson, 1979; Pauli, White, & McWhinney, 2000a, 2000b, 2000c; Sturmberg, 2005).

The current method of modern medicine is mainly based on traditional Cartesian dualism, and its approach is mono-causal reductionist and linear (Pauli et al., 2000a, p. 19). In Adler’s view (Adler, 2000, p. 1250), it is the problem of so called hard data and soft data. Based on Cartesian philosophy, we have the splitting of subjective and objective.

For example Adler uses a clinical case to explain the problem. He describes a man who was admitted because of chest pain in respiration in his right side. He was managed with the primary diagnosis of pulmonary embolism. But except for an infiltration in his chest X-Ray there was no sign of embolism. In an interview he informed the doctor that his wife had been hospitalized with a pulmonary embolism and died. His physicians finally found out that the X-Ray’s infiltrates were also present in previous X-Rays and concluded that the symptoms of the patient were a kind of conversion symptom connected with grieving. In this case, ignoring soft data and sticking to the hard data misled the doctors (Adler, von Uexküll, & Herrmann, 2002, p. 1250).

Adler explains this problem as follows:

The human element is removed from nature and the living organism receives the attributes of an engine functioning by physical and chemical laws and assembles by count and measure…. And we rely too much on technological data and not enough on human perceptions. … this had led to omission of an enormous amount of crucial clinical data from the scientific analysis. (Adler, 2002, p. 1250)

But in the medical universities and in the atmosphere of clinical medicine, medical students and practitioners are so busy that they rarely think about philosophical and conceptual bases of what they do (Pauli et al., 2000a).

In the following pages, I shall try to show by some examples how the materialistic-reductionistic view of the biomechanical model of current western medicine is deficient.

Medicalization

Originally the term medicalization was coined by Ivan Illich in his book Limits of Medicine, where he criticized the foundation of modern medicine and claimed that modern medicine is the most important threat to human health (Illich, 1976).

This criticism was in coordination with his criticisms of other institutions of the modern world such as modern education and the modern transport system (Dupuy, 2003, p. 159). His main concept is the concept of counterproductivity. He says that when major institutions of a civilization grow beyond a threshold, they will become counterproductive, meaning that they begin to inhibit people from reaching the goals they were designed for by the people who constructed them (Dupuy, 2003, p. 159).

Another important criticism of current medicine is of by Michel Foucault in his book The Birth of the Clinic (1973) and other works. He again uses the term
medicalization but speaks chiefly of *power*. He claims that the health care system gains a kind of social power in society and he uses the term *the medical gaze* to express how medicine establishes a kind of social control over society. In the case of mental disorders, he has sought to show how governments through history have used psychiatry to label people who think differently as mentally ill, and legally confined them to hospital to suppress their new ideas which were in contradiction with powerful interests.

Following these two criticisms, many debates about medicalization emerged in the medical literature. These debates made several aspects of the problem clearer, for example:

- Most important is the effect of drug manufacturers on medicine and their relation to the health care system. These manufacturers try to define new “diseases” to sell their products, and this has led to great amounts of anxiety in society (Moynihan, Heath, & Henry, 2002).
- The normal activities and concepts of life become medicalized, implying that they became medical issues. For example death has become a failure of a medical team struggle (Clark, 2002). A pregnant woman is regarded as a patient who should be under professional control and care (Johanson, Newburn & Macfarlane, 2002). Some normal events in human life which are the result of aging like men's baldness and skin wrinkles are defined as medical problems (Ebrahim, 2002).
- The growth of genetics leads to new information about the human genome and new tests for finding genetic problems can be designed, but the exact value of these tests for interventions to make people healthier is unclear (Melzer & Zimmern, 2002).
- There are risk factors which are defined as diseases. One example is osteoporosis. It is not clear to what extent diagnosis and treatment of bone loss in old people prevent future fractures (Moynihan et al., 2002).
- There are screening tests the usefulness of which is not clear. For example the usefulness of some screenings for cancers like breast, colon and prostate cancer is not clear (Cotzsche, 2002; Tuffs, 2002).

These problems actually arise from a paradigm of medicine in which there is an exaggerated emphasis on disease and its classification. As Uexküll and Pauli (1986, p. 159) state, this accords with the modern industrial age, in which illness should be defined in a manner such that the growth of technology can solve the problem. This definition of disease and illness gives space to manufacturers to invent new drugs and diagnostic methods for the ordinary problems of life.

We can also find this conception of disease and illness in a recent movement in medicine which is called *evidence-based medicine*. 

Evidence-Based Medicine

In recent years there has been a new approach in medicine, which is described as a new paradigm in medical education and practice: evidence-based medicine (Henry, Zaner, & Dittus, 2007).

Cochrane Center, the international non-profit center which is a center for “up to date, accurate information about the effects of healthcare” (Cochrane Center, n.d.) defines evidence-based medicine as below:

Evidence-based health care is the conscientious use of current best evidence in making decisions about the care of individual patients or the delivery of health services. Current best evidence is up-to-date information from relevant, valid research about the effects of different forms of health care, the potential for harm from exposure to particular agents, the accuracy of diagnostic tests, and the predictive power of prognostic factors. Evidence-based clinical practice is an approach to decision-making in which the clinician uses the best evidence available, in consultation with the patient, to decide upon the option which suits that patient best. Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research (Cochrane Definition of Evidence-based Medicine, n.d.).

This represents the positivist view of science. In the second half of the 20th century post-positivist philosophers like Thomas Kuhn, Paul Feyerabend and Norwood Hanson challenged this picture of science. They claimed that observation is theory-laden: that is our observations are “colored” by our background assumptions. Also, Duhem and Quine have argued that theories are underdetermined by data. In other words, our theory choices are never determined exclusively by “the evidence” (Goldenberg, 2006, p. 2623). Post-positivist philosophy holds that observations are not givens or data but the products of interpretation in the light of our background assumptions. These ideas in philosophy of science correspond to the ideas of cyberneticians like von Foerster and Varela which we will discuss later.

As the famous British physician Sir William Osler said: “It is more important to know what sort of a patient has a disease, than what sort of a disease a patient has” (quoted in Sturmberg, 2005, p. 237).

In Wikipedia’s article about evidence-based medicine it is mentioned that:

EBM recognizes that many aspects of medical care depend on individual factors such as quality and value-of-life judgments, which are only partially subject to scientific methods. EBM, however, seeks to clarify those parts of medical practice that are in principle subject to scientific methods and to apply these methods to ensure the best prediction of outcomes in medical treatment, even as debate about which outcomes are desirable continues. (Wikipedia, n.d.)

But these aspects of medicine, which are regarded as only partially subject to scientific method, have an important role in clinical decision making.

In my view, the mechanistic conception of doctor-patient relationship is an oversimplified version of what really happens in clinical practice.

As Uexküll and Pauli explain:
During the first session with the patient, the physician should proceed from the assumption that the patient has a different conception of his or her illness than does the physician and that attaining knowledge of this conception is an important approach to the patient individual reality. Agreeing with the patient on a common model of explanation is a prerequisite for establishing a reality common to both of them. If that is not possible, at least a mutual understanding of both models should be sought. (Uexküll & Pauli, 1986, p. 171)

In reality in the clinical encounter, doctor and patient are involved in a complex dialogue and the final clinical decision making completely depends on the way that this dialogue proceeds.

Hence I think that forcing doctors to use evidence-based clinical guidelines will destroy their effective rapport with patients, whose trust and confidence in their doctor will decrease.

To explore the roots of this problem, it is reasonable to think more critically about basic concepts of medicine, health and disease.

**Health Versus Disease**

One of the important characteristics of modern medicine’s method is its classification of diseases. In medical universities, the classification of diseases which is used for medical training implies that diseases are entities which are present in the world outside and it is the doctor’s duty to find out, according to signs and symptoms, which disease is present in the patient he or she is visiting. But in reality this is an oversimplified assumption (see Pauli et al., 2003c, p. 175).

One of the major references in this regard is the international classification of disease prepared by the World Health Organization (WHO). It has been shown that “up to 60 percent of problems that patients bring to practicing physicians can not be fitted in to this classification system” (White, quoted in Pauli, White, & McWhinney, 1998, p. 8). Hence it can be said that this classification is just a tool for management of data gathered from patient (Pauli et al., 1998).

Similar to this conception of diseases as real entities in the outside world, WHO also has tried to define health. This definition is: “a state of complete physical, mental, and social well-being and not merely absence of disease or infirmity” (WHO, 1946).

But Imre Loeffler has said that this definition of health “is achieved only at the point of simultaneous orgasm, leaving most of us unhealthy…. most of the time” (Loeffler quoted in Smith, 2002, p. 884).

In this conception, the main focus is on diseases. It is the duty of the health care system to discover unknown diseases and there is little emphasis on health because health is generally assumed as a defined state and with the elimination of diseases we can help people to reach this state. This has led to more and more ramification of medical specialties and vast amount of new, expensive and complex technology in search of these new diseases (Pauli et al., 2003a).

Critics of this set of ideas believe that health can not be defined as a static concept and diseases should not be classified rigidly. We need a dynamic conception of these two notions.
To show how personal experiences and beliefs of people can change their health status, and also to show how complex the definition of health is and how different points of view can lead to different approaches, I use two examples: (1) logotherapy and (2) psychopathology and creativity.

**Meaning of Life: Victor Frankl’s Logotherapy**

Victor Frankl was a psychiatrist who had been imprisoned in Auschwitz and other Nazi concentration camps. Based on his experience he introduced a new method of psychotherapy named logotherapy. In this method he emphasizes, as he terms it in his famous book *Man’s Search for Meaning* (Frankl, 1963, p. 52). In Nazi camps, he found that people who had an end which gave meaning to their life survived better. Hence, in logotherapy the therapist should try to help patients to find their own meaning of life. Frankl explains that in today’s psychotherapy methods, suffering is a bad aspect of life which should be eliminated and people should be happy all the time. For him this is a wrong idea because suffering is woven in life’s texture and it is impossible to eliminate it. Then people are sad because they are sad and this increases their sadness! He concludes that we can not eliminate suffering from life but we should find out why suffering is meaningful in life’s context (see Frankl, p. 77). Although Frankl’s method was a method for psychotherapy I think that his ideas are so important in medicine too.

Here I want to bring an interesting example. In the classic text of psychoneuroimmunology (Ader, Cohen, & Felten, 2000), David L. Felten, MD, PhD, Director of Neuroimmunology at the Loma Linda University School of Medicine, tells a personal story relevant to this debate. He speaks about his mother Jane Felten who was paralyzed at 8 years old because of poliomyelitis. Despite this disability, she was married and gave birth to children and cared for them (Felten cited in Dreher, 2003, p. xxi).

Then he asks:

Do we understand how the support of a loving and caring husband contributed to neural signaling that helped her through overwhelming adversity, such as repeated bouts of pneumonia and cardiac failure? (Felten cited in Dreher, 2003, p. xxii)

In medicine—as Felten noted—considering the human as a network of molecular interactions could never reveal his power in coping and living.

One important role of any health care system is to modify bad life styles of the community and it is generally accepted that prevention is better than cure. Consider the case of smoking. It is unavoidable to accept that the contents of cigarette smoke relieve smokers’ sufferings. Now if you want to tell someone not to smoke you should have a response to this question: “Why should I suffer?” But, virtually in medical universities there is little space for such discussions. Inevitably doctors’ approaches become mainly therapeutic and not preventive and lifestyle modification directed.
Creativity and psychopathology

There are several researches showing the relationship between mental illnesses and creativity (Juda, 1949; Hasenfus & Magaro, 1976; Frosch, 1987; Richards, 1981; Ludwig, 1989; Post, 1994).

For example, the rate of creativity in family members of schizophrenic patients is higher than in the normal population. Also, historically it has been shown that there were a large number of creative people with known mental illnesses, for example persons like Van Gogh, Wittgenstein and Gödel (see Preti, 1996, p. 7). The questions emerge in our minds, “who is normal?” and “what is normality?”

If we consider that our perceptions cannot capture all outside reality and if we also consider that our perceptions are partly genetically defined, it is easily understandable that a person, whose perception system is genetically different from the average, cannot participate in the common intersubjectivity. Hence such a person lives in a different world and perceives reality in a different way. Then it is obvious that this person acts differently too and his or her behavior seems to be strange for others.

It does not mean that we should not use drugs to control disabling symptoms of mental diseases, but when we deal with the patient we should consider that they have some kinds of capabilities for perception that the general population lacks. It means that this special person has a special world and if we can help that person to control this unique kind of perception he or she can be very creative and innovative. Hence using an interdisciplinary method for treatment of mental diseases with emphasis on the patients’ lifeworld would not only help them to live their daily life, but also may help them to use their unique creative potential for generating new ideas.

Historically, it was around 1970 that a movement emerged in psychiatry which was named by one of its pioneers antipsychiatry (Nasser, 1995, p. 743). R. D. Laing is considered the true father of this movement although he never regarded himself as an antipsychiatrist. He belonged to the psychoanalytic school and his thoughts reveal his admiration for existentialist philosophical ideas (see Nasser, p. 744).

For Laing, to understand madness you must study the family. However, the skewed family which in his view is responsible for madness is itself representative of an overall repressive social structure (Nasser, 1995, p. 744).

Another important figure in this movement was Thomas Szasz. He described mental illness as a metaphorical illness because the mind is not an organ or part of the body hence it cannot be diseased as the same way as the body can (Nasser, 1995).

This view is in coordination with new philosophical conceptions of mind. For example Ludwig Wittgenstein and his modern followers argue that mind is not inside but “out there” in the middle of the social world (Bracken & Thomas, 2002).

Postpsychiatry is regarded as a new direction of mental health beyond psychiatry and anti-psychiatry. It uses a context centered approach for understanding madness and also it engages a non-Cartesian model of mind for this understanding (Bracken & Thomas, 2001).

The antipsychiatry movement is not as active as it was at its beginning but as Nasser states:
The greatest impact of the antipsychiatric movement is seen in the shift of focus from the large mental institutions to the provision of care in the community. This trend is the product of various schools of thought and the antipsychiatric ideology is certainly one of them. (Nasser, 1995, p. 746)

Hence we cannot claim that antipsychiatry has vanished because we can trace its effects on conceptions about mental illness.

But inside the Western medical paradigm the situation is different. As Nasser explains:

the medical establishment seems to have departed from the social model and is now more interested in biological theorizing, believing that the organic model is likely to be the one that offers better understanding of the nature of mental illness and serves the needs of the mentally ill. (Nasser, 1995, p. 746)

The overemphasis of western medicine on biological aspect of diseases and neglecting the context in which diseases emerge can be misleading and for example in the case of mental illness—as I discussed in this section—this approach can suppress the sources of creativity and innovation.

In summary, it seems that to have a true understanding of health and disease we need a revised conception of mind—not only because a comprehensive understanding of mental illness can only be achieved in its socio-cultural context, but, as we will show further and as we saw in Frankl’s experiences, there also is a tight interaction between body and mind functions and it is the overall biopsychosocial state of the people that ultimately reveals their health status.

Part 2: New Ideas in Scientific Thinking Emerged in the 20th Century

The Change of Epistemology of Science

Since the beginning of the 20th century new approaches have changed the scientific world view (Paul, 1998). The process started in physics with the introduction of quantum mechanics by Bohr and Heisenberg and of the theory of relativity by Einstein among others. It further evolved with the development of cybernetics by Wiener, information theory by Shannon, systems theory by von Bertalanffy, nonequilibrium thermodynamics by Prigogine, and theory of chaos by Prigogine and Bohm (cited by Pauli et al., 2000a, p. 22).

One important conceptual change was a new approach to subjectivity and objectivity. It was shown that the relationship between observer and observed is not as simple as previously assumed (Pauli et al., 2000c).

Cybernetics and Related Movements

The term cybernetics was proposed by Norbert Wiener and defined as the study of control and communication in the animal and machine. It can be generally understood as the study of abstract principles of organization in complex systems (Joslyn & Heylighen, 1998). In time cybernetics expanded and influenced many different areas.
dealing with complex adaptive systems like biology, mathematics, physics, anthropology, sociology and electronic engineering (Jutoran, 1985).

In the 1940s, Gregory Bateson attended a series of conferences held by the Macy Foundation in which he became familiar with Wiener’s concepts in cybernetics and he was influenced deeply by these ideas (Jutoran, 1985). In his later theorizing, for example in the formulation of double bind theory of schizophrenia, Bateson was inspired by cybernetics (Gibney, 2006).

Another important thinker whose ideas were close to cybernetic concepts was Jakob von Uexküll. He developed a kind of negative feedback system in his functional cycle model which was only to be formulated mathematically by Norbert Wiener twenty-three years later (Uexküll & Pauli, 1986).

Second-order Cybernetics
Recognizing the limits of current methods of enquiry in knowledge, some scientists began to search for new methodologies and this led them to question the way we gain knowledge as human beings. Questions of this kind have always constituted the basic problem of philosophy named epistemology, but this new generation of scientists (like McCulloch, Lettvin, Von Foerster, Varela & Maturana) now tried to introduce epistemology into the field of biology (Jutoran, 1985, p. 3).

One field in which this concept is crucially under investigation is second-order cybernetics. In cybernetics we deal with rules by which we can control a machine. Then in cybernetics there is an observer who studies the behavior of the system. In second-order cybernetics we study the observer and the observer’s behavior. These studies generated ideas like recursivity, circularity, self reference, self organization and autopoiesis (Jutoran, 1985, p. 9).

In the works of scientists like Shannon and Stonier, information is regarded as a real outside entity independent of an observer and the observer’s task is to capture as much as possible of this information to reach a better understanding of the world (Brier, 1992; Qvortrup, 1993).

This conception is in contradiction with second-order cyberneticians’ understanding of information. For example, Gregory Bateson explains that when we interact with the outside reality and we find a difference, we make a difference (in our own mental level) and hence he defines information as “the difference that makes a difference” (Bateson, 1972, p. 453). This means that although there are many differences in the world outside, only differences which are noticeable for this particular organism can be considered information and these are the data that make a difference in it at a mental level (Brier, 1992; Qvortrup, 1993).

Autopoiesis
Humberto Maturana and his student Francisco Varela developed a model to explain how living systems create themselves. In their view a living system is a closed loop and it self-organizes. There is no “objective” information for it and no access to an external, objective world. Instead, when it encounters perturbations, it adapts itself in
order to survive. This happens via a process they named structural coupling (Brier, 2003a, p. 83).

An organism reacts to changes in order to preserve its own organization and the self boundaries of the organism are defined by the closed loops in which self-organizations occur.

**Luhmann’s Model of Triple Autopoiesis**

German sociologist, Niklas Luhmann tried to expand the autopoiesis model to develop a communication model up to the level of social communications. He was influenced by Von Foerster, Bateson, Maturana and Varela. Three types of autopoiesis are considered in his model. These are biological, psychological and social autopoiesis. Simultaneously on all levels there are internal and external communication processes taking place (Brier, 2003a, p. 85; see figure 1).

For Luhmann, the process of communication is a sequence of three selections: of information, of utterance, and of meaning. It is the sender’s task to make a choice of information and utterance. The selection of meaning is made by the receiver (Brier, 2003a).

![Figure 1: Luhmann’s model of triple autopoiesis in which three organizationally closed systems working separately make communication possible. The signification sphere is the biosemiotic term for Uexküll’s Umwelt and Maturana’s “cognitive domain.” This figure is taken from (Brier, 2003a, p. 85).](image-url)
Biosemiotics
As Jesper Hoffmeyer stated one important trend of 20th century is the semiotization of nature (Hoffmeyer, 1995, p. 1).

The International Society of Biosemiotic Studies (ISBS) defines biosemiotics as below:

Biosemiotics is an interdisciplinary research agenda investigating the myriad forms of communication and signification found in and between living systems. It is thus the study of representation, meaning, sense, and the biological significance of codes and sign processes, from genetic code sequences to intercellular signaling processes to animal display behavior to human semiotic artifacts such as language and abstract symbolic thought. (ISBS, n.d.)

In this view we have a common language for speaking about different levels from cellular and molecular biology to social interactions in society. “Semiotic holds a unique place among the sciences. ... [It] is not merely a science among sciences but an organon or instrument of all the sciences” Charles Morris said (quoted in Sebeok 1999, p. 86).

Hence as we can speak about life in different sciences, we can use semiotics as a translator of what we mean to other sciences. It can be regarded as a bridge between two cultures. Hoffmeyer explains that:

However, what makes biosemiotics important and interesting for science in general, is its attempt to research the origins of semiotic phenomena, and together with it, to pave a way of conjoining humanities with natural sciences, culture with nature, through the proper understanding of the relationships between ‘external and internal nature. (Hoffmeyer quoted in Kull, 1999a, p. 2)

In other words the complete understanding of sign interpretation process in life can direct us toward an ultimate meaning of life. And it is the scientific translation of what has been done in humanities for example in hermeneutics, to define how the human understands. This is what Chebanov mentioned and named this trend as biohermeneutics (cited in Kull, 1999a, p. 4).

There were several thinkers which had works related to semiotics but did not use semiotic terminology. Sebeok named them cryptosemiocians. One of these cryptosemiocians is Jakob von Uexküll (cited in Kull, 1999b, p. 2). He was a biologist and his researches in this field led him to some new concepts. Among them was the important concept of functional cycle or Umwelt. By functional cycle he tried to define the way in which an organism constructs itself. It is a closed loop in which action and perception interact. In his view the boundaries of organism’s self is defined in a semiotic manner and these boundaries are created in its Umwelt (Rüting, 2004, p. 14). (See figure 2)

His son, Thure von Uexküll linked this idea with medicine and he is regarded as one of the main pioneers of psychosomatic medicine (Kull & Hoffmeyer, 2005).
Then there were some semioticians who even used the word *biosemiotics* but they had no exchange of this idea with others. Kalevi Kull (1999b, p. 2) named them *endemic semioticians*. One of these endemic semioticians is Friedrich Salomon Rothschild, German psychiatrist. In an article in 1961 (as cited in Kull, 1999b) Rothschild suggested that the semiotic approach of Charles Morris is a good way for overcoming the Cartesian dualism and he used the term *biosemiotics* (Kull, p. 1). According to the facts that Rothschild was a psychiatrist and that he was among the first scientists who used the term biosemiotics we can claim in a manner that medicine was the branch from which for the first time the concept of biosemiotics was born (Kull, p. 3).

Rothschild discusses the importance of the transformation of the inner communication systems of organisms into forms of intentionality. Also he paid attention to the role of polarity in different aspects of the living organism (the differentiation of motor and sensory systems in the sensory-motor foundations of experience and behavior, the bisexual disposition of organisms, the asymmetry between right and left, the differentiation of the vegetative nervous system into a parasympathetic and sympathetic component, and the arrangement of the central nervous system in homolateral and heterolateral centers) in the communication of the subjectivity of the organism with the objective surrounding world (Kull, 1999b; Anderson, 2003).

I think Rothschild’s ideas are compatible with a cybersemiotic model (which we will discuss in the next section) and exploring his ideas can help to bring phenomenological and inner aspects of human experience back to medicine’s paradigm. Lack of this perspective is virtually one of the most important drawbacks of the biomedical paradigm of current western medicine.

Figure 2: The model of Umwelt (functional cycle) according to Jacob Von Uexküll (1928/1973, p. 158).
Cybersemiotic Model

Søren Brier’s cybersemiotic model is an attempt to join ideas in second-order cybernetics, Peircian biosemiotics and the Luhmannian theory of triple autopoiesis (Brier, 2003a). It is a map for human understanding. As Popper suggested when somebody asks “how do you gain your knowledge?” the response is “I don’t know? There are several ways by which knowledge can be gained” (Popper, 2002, p. 77). It means that we have many implicit tools to gain a kind of knowledge which Polanyi names tacit knowledge (Smith, 2003). In fact we cannot exactly define our ways of knowing but we have some “main” ways of understanding which are more important in comparison with other ways and they are more worth mentioning. In the cybersemiotic model we deal with these ways and the manner in which these paths interact, and with what is the position of meaning in a person’s life and how it emerges.

Through modern second order cybernetics, autopoiesis theory and chaos and complexity research a view of body and mind as self-organizing and self-producing systems is now being developed (Brier, 2003a, p. 86; see figure 3).

![INTERNAL SEMIOSIS](image)

Figure 3: shows in a symbolic iconic simplified way the relation between phenosemiotics (prelinguistic experiences), endosemiotics, thought semiotics and intrasemiotics (semiotic interaction between the biological and the psychological levels, but now reformulated in cybersemiotic terms). This figure is taken from (Brier, 2003a, p. 88).

Based on this model the connection between the inner-world and the outer-world of the person is explained. Cybernetics and systems theory are good frameworks in
which self-organization of biological systems can be explained. But these frameworks
do not have a theory of signification and biosemiotics helps to develop such a theory.
It is reasonable to try to integrate them all in the same paradigm and this is what Søren
Brier attempts in his cybersemiotic model (Brier, 2003a).

According to autopoiesis theory, it is via structural couplings between person and
environment that human beings can define their self domain. This is virtually
equivalent to the Uexküllian Umwelt, and to the biosemiotic signification sphere in
Brier’s cybersemiotic theory (see Brier, 2003c, p. 14).

In exosemiotics (interaction with outer world) there are three levels of
communication (Brier, 2003c, p. 18).

1. languaging in the level of signals and information which is considered as
    protosemiotics
2. biosemiotic sign games of all living systems mostly within species—for
    example basic biological drives in humans.
3. language interactions and dialogue between self-conscious persons (See
   Figure 4)

Figure 4: shows the three different levels of communication systems described in cybersemiotics. At the
foundation is the informational exchange of signals of orientation and other reflexes. On the next level we
find the biosemiotic sign games of all living systems mostly within the species, which still works for the
basic biological drives in humans. Then there is the level of language interchange in dialogue between
self-conscious persons. This figure is taken from (Brier, 2003a, p. 89).

Interaction of two or more persons via language games creates the common
signification sphere of culture (Brier, 2003a).
The whole model is summarized in figure 5: on the left the interaction of autopoietic closed systems is shown, in the middle communicative aspects or exosemiotics is shown, in the near right the internal semiotics of the organism is demonstrated, and on the far right the organism’s perceptual connection to the environment is shown which creates its signification sphere. This is virtually Nöth and Kull’s ecosemiotics. In the cybersemiotic model, language games are the result of evolutionary development of animals’ sign games combined with a signification sphere (Brier, 2003a, 2008).

In this theory, meaning is the result of semiotic processes in the body and the psyche, their interaction with the environment and other persons. In mutual structural couplings with another person, sharing of signification spheres becomes possible and new understanding can be achieved (Brier, 2003c, 2008).

In summary, the cybersemiotic model explains how different levels of hierarchy of human being are linked and this is what we need for designing a holistic and scientific paradigm for medicine. In this context biosemiotics is helpful for constructing a common language, translating the concept of different levels to its own terminology.

In the next section I will try to explore the applications of the new ideas introduced in this section in the space of medicine.
signification sphere. When these are combined through socio-communicative autopoietic language games a common signification sphere of culture is created. One part of ecosemiotics signification is based on the linguistic processes of conceptualization and classifications. Underneath language games is the biological level of instinctually based sign games, and under that, the cybernetic languaging game of the coordination of coordination of behavior (of two black boxes). Thus, ecosemiotics also has a level of biopsychological or emphatic signification, as well as a level of structural couplings, which the organism, or rather the species, has developed through evolution. This figure is taken from (Brier, 2003a, p. 91).

Part 3: The Implications of New Concepts in Medicine

The biopsychosocial model of medicine has been developed, expanded and emphasized by Pauli et al. (2000a) and Sturmberg (2007), emphasizing the need for an in context conception of disease.

Their activities were in accord with similar activities in other branches in science. C. P. Snow (1959) in his book The Two Cultures mentioned that there was a gap between literacy and science which should be filled. In response, John Brockman in his book The Emerging Third Culture (Brockman, 1995) introduced a group of scientists who communicated well with the general public and whose new ideas had the potential to fill the gap. This group of scientists included Stephen Jay Gould, Lynn Margulis, Marvin Minsky, Murrav-Gell-Mann and Francisco Varela (Brockman cited in Brier, 2006, p. 211).

In their books these scientists have tried to explain the philosophical consequences of a new evolutionary worldview of complexity and self-organization more popularly (Brier, 2006).

Actually, as Brier explains (Brier, 1997, p. 12), we need a new framework in human knowledge in which there are positions for different aspects of human understanding. In a comprehensive paradigm for knowledge we should be aware of different kind of reductionisms. We should be aware of reducing phenomena to psychic events, social events and—as is happening in current western paradigm of biomedicine—to biological events.

As Pauli and his colleagues say: “This dominance of the Newtonian paradigm [in medicine] and the institutional resistance to change thinking about manifestations of life has been maintained up to these days” (Pauli et al., 1998, p. 2).

But change is unavoidable. Pauli and his colleagues respond to the question, “Are there reasons now to engage in a discussion of medicine’s terms and concepts in the context of today’s worldview?” by answering: “The revolutionary transformation during the 20th century in the scientific paradigm underlying medicine should no longer be ignored” (Pauli et al., 2000a, p. 23).

Hence, we need a new framework for defining the main concepts of medicine like health, disease and illness according to which new methods of disease management and treatment can be found, and more importantly, better preventive measures can be instructed. Human beings are very complex and have different levels of being for defining their health. We thus need different disciplines; in other words defining the
health of humans is a multi-disciplinary task and needs interdisciplinary work (Engel, 1980).

Søren Brier explains:

Although it is a good thing to learn from the rigor in method and analytical rationality which has been developed in the sciences the medical and health area in my opinion is basically interdisciplinary including aspects both from the sciences, the humanities and the social sciences. It is important to keep in mind that a major point will be to attempt to integrate scientific thinking with social and psychological perspectives both in theory and practice. It is important to counteract the tendency to put all authority on the scientific kind of knowledge within the medical area. (Brier, 1997, p. 18)

Designing such a framework gives spaces to different medicines form different cultures and is a way to integrate different alternative and complementary methods of medicine in a comprehensive paradigm of integrative medicine.

As different cultures and societies develop their own illnesses, using such a paradigm can be helpful in solving the problems like culture-related syndromes which are by definition “a number of lay terms for clinical pictures which can not be classified according to the nosological system of western medicine” (Uexküll & Wesiack, 1997, p. 36).

In section one I tried to show that we can speak about health in different disciplines like psychological health, social health, and somatic health. But I think because these disciplines are apart and are not integrated, we do not have enough knowledge about the effects of changes in one domain on other domains. In this section I want to explain how new concepts which I introduced in previous sections are all integrated in the cybersemiotic model, and can be used for defining a new philosophical framework in medicine.

**Health Semiotics**

Interestingly, Thomas Sebeok in his book *An Introduction to Semiotics* mentions that the roots of semiotics are in medicine (Sebeok, 1994, p. 50). In medical literature, there are some debates about the position of semiotics in medicine (Burnum, 1993; Malterud, 2000), but these discussions mainly focus on the process of diagnosis of disease and the use of signs and symptoms to direct the doctor toward correct diagnosis. But, what I mean here by *health semiotics* encompasses broader categories as I will explain.

Recently there have been some debates in medical literature about the advantages and disadvantages of direct-to-consumer advertisements of drugs. In this method of advertisement, pharmaceutical companies directly introduce their products via media to patients. There are concerns about that this process disturbs the healthy doctor-patient relationship because patients ask doctors to prescribe special products. Also drug companies try to redefine diseases. Obviously, in these advertisements cultural and art semiotics is used to change the people’s behavior (Moynihan et al., 2002; Metzl, 2007).
In this way, these drug companies use different semiotic tools to create what Searle names a social fact by virtue of “collective intentionality” (Searle, 1995, p. 5). This social fact is a new disease and after that they can introduce their own new treatment and sell it to a community.

By contrast, I think that by using these powerful semiotic tools we can instead change the lifestyle of community members to help them to have a more productive life and to incorporate new habits in daily life to prevent diseases. It means that using art and cultural semiotics we can create new health for society. In this sense, semiotics will be a tool to incorporate lifestyle modification programs in different levels of the health care system, from personal doctor-patient relationships to health policy making at the level of society.

Cybersemiotic Model and Medicine

Now I try to define the concept of health based on this model. In the first level we deal with biological autopoiesis. In this level there are several levels embedded according to the hierarchy of life. In the micro-level of molecular interactions we have a kind of autopoiesis, and other kinds of autopoiesis can be seen up to the macro-level of organ systems, which are related in an integrated format, in which each organ regulates itself according to messages received from the whole system and environment.

When a living autopoietic system encounters a new pattern, it self-organizes itself in a manner that prevents its destruction. Then actually, self-organization is a kind of defense mechanism. Now I try to see the act of defense in the organism from this viewpoint.

Biological Defense Mechanisms

The most important system which helps to maintain the body’s health is the immune system. Varela’s ideas about the immune system are based on autopoiesis in order to bring a new vision about the immune response function and regulation:

I’ve been developing a different view of immunology—namely, that the immune system has its own closure, its own network quality. The emergent identity of this system is the identity of your body, which is not a defensive identity. This is a positive statement, not a negative one, and it changes everything in immunology. In presenting immunology in these terms, I’m creating conceptual scaffolding. We have to go beyond an information-processing model, in which incoming information is acted upon by the system. The immune system is not spatially fixed, it’s best understood as an emergent network. (Varela, 1995).

Varela sees the immune system as an autopoietic system embedded in the greater autopoietic system of the living organism (I can name it the body-mind system) and its state is the result of its continuing communication with this greater system just as the organism’s state is defined by its continuing communication with the systems of nature and society.
In this view we can find explanation for problems like AIDS, cancer and autoimmune diseases:

Classical medicine remains baffled by the spectrum of diseases known as autoimmune diseases. Why? Because autoimmune disease is outside the paradigm of immunology. There’s nothing to vaccinate against; there’s no bacteria coming from outside. It’s something that the system does to itself. AIDS is a dramatic case of the deregulation of this coherent emergent property, much like ecological dysfunctioning. People think AIDS is an infection. This is, of course, true, but not true in the sense that once the system is infected with AIDS it triggers a condition of self-destruction of the immune system. HIV triggers a deregulation, which then amplifies itself and becomes its own nightmare. Thus when you look at the urine of an AIDS-infected patient, less than 5 percent of the dead lymphocytes are HIV-infected. (Varela, 1995)

Then in Varela’s view, in autoimmune diseases, the immune system’s problems are with communication. In a manner, I can compare it with Bateson’s double bind theory of schizophrenia at the psychological level (more on this below). Similarly, here the immune system gets paradoxical messages from the environment and the interpretation of these messages finally leads to deregulation of its autopoietic state.

But how does this communication occur? The answer is via semiosis.

The immune system is a topic of interest for biosemioticians and Sebeok’s discussion puts it into a broader view of semiotics:

Semiosis is the fulcrum around which another [apart from the first endosemiotics topic, genetic codes] emerging interfacial discipline recently dubbed semio-immunology or immunosemiotics turns.

The central problem immunologists keep struggling with is how the healthy immune system manages to recognize and respond to an almost infinite number of alien organisms and yet fails to assail components of self. What has become reasonably clear is that a single line of defense against potential pathogens is not enough and that there are dissimilitudes between antigen recognition by T cells and that by B cells. Jerne has proposed (1985) a model of particular interest to semioticians, including especially linguists, with his claim that the immense repertoire of the vertebrate immune system functions as an open-ended generative grammar, “a vocabulary comprised not of words but of sentences that is capable of responding to any sentence expressed by the multitude of antigens which the immune system may encounter….”

The human immune system consists of about 1000000000000 cells, dissipated over the entire body, excepting only the brain, but the former and the nervous system are known to exercise pervasive mutual sway one over the other by means of two-way electrochemical messages. (Sebeok, 1999, p. 89)

In emerging mind-body science we see that new scientific discoveries are compatible with the idea that there is continual conversation between the brain and the immune system. Immune cells secrete neurotransmitters and have receptors for neurotransmitters too. Neural cells also have receptors for immune regulatory hormones and themselves secrete such hormones (Derher, 2003, p. 17).

Considering the hierarchy of different levels of the human being in a systemic view, in this section we have dealt with the cellular and biological level of being and the processes in this level are explored as endosemiosis in the cybersemiotic model.
On the next level we deal with psychological processes and their interactions with other levels.

**Psychological Defense Mechanisms**

When we encounter a situation which is not understandable for us we use psychological defense mechanisms. These mechanisms include: denial, dissociation or conversion, splitting, projection, idealization, regression, obsessional defense and intellectualization (Souhami & Moxham, 1999, p. 187).

When our internal model of reality does not match with external reality, we have two choices, we can change the outside reality or we can change our model. In cases where we are not capable to change the outside we try to change our own model. The ultimate effect of this change on people’s behavior can be a good effect or a bad effect.

The organization of brain neural networks is closed. Then if somebody deprives themselves from interaction with the world, gradually, their conceptions become modified by continual circling of ideas in loops of neurons. Their model of reality changes and changes, and its difference with the world’s reality and its events increases. When this difference reaches to an intolerable threshold, the system is destroyed, and in the human case it may self-destruct. For example, as Bateson in his double bind theory of schizophrenia explains, paradoxical messages from the world around a person can destroy that person’s discrimination of reality and non-reality. The components of a double bind situation are:

- two or more persons are involved
- the experience that traumatizes the victim happens repeatedly
- A primary negative injunction in the form of “if you do so and so I will punish you”
- A secondary negative prohibition which is in conflict with the first usually at a more abstract level
- A tertiary negative injunction which says that “you should not leave the situation”

(Gibney, 2006, p. 50)

Again here these states of mind (like depressed mood or disappointment) interpenetrate biological autopoiesis. This has been proved in psychosomatic medicine. For example there are several kinds of evidence to show that depression makes the body vulnerable to somatic diseases (Yang & Glaser, 2000; Olff, 1999). But the exact patterns of this relationship are not known yet. For example, we can find lots of knowledge about interpretation of dreams through works of Freud and Jung and other psychologists but little has been done about the relationship between dreams and somatic diseases.
Unified Defense Mechanism
I think as Varela mentioned the problem of current immunology is that it is searching for the rules of immune system regulation in the context of a person’s biologic self and when it encounters autoimmune diseases it seems paradoxical. For a true explanation of immune system regulation we should regard it as within the person’s Umwelt. As the different levels of autopoiesis interpenetrate each other the ultimate state of the immune system is a result of all effects caused by these levels’ interactions.

It means that if we want to change the person’s Umwelt, we should know about the context in which this person lives. Then we need a kind of knowledge that shows us that how different life patterns can change the organization of the immune system and to gain this knowledge we need a special kind of research methodology. I think the new methods emerging in qualitative research can offer us a new way for finding these relationships. Obviously, the results of these kinds of researches will show us how we can plan for a multidisciplinary treatment method in which interventions in different aspects of patient’s life should be done.

Exosemiotic: Doctor-patient Relationship
Another concept in cybersemiotic model is Exosemiotics. Actually when a doctor visits a patient, what Maturana and Varela named “structural coupling” happens. Even ordinary people know that beyond a physician’s scientific knowledge there are many other factors involved that make a doctor successful and better than others. This is a kind of tacit knowledge which some doctors have and others lack (Henry et al., 2007). As George Engel explained in clinical practice the physician deals with human characteristics of a person and in his view the most important tool for bringing these characteristics into scientific inquiry is language (Engel, 1997). Actually I think although language has a very important role in interpersonal communication, but there are many other semiotic factors involved in communication and all these factors are involved in a successful healing process. Now I will try to explain this using cybersemiotic terms.

Lifeworld
The psychiatrist Mishler has used the communication action theory of Habermas for the doctor-patient relationship. He suggested that commonly in the doctor-patient relationship, the doctor is in a higher level of authority and asks technical questions about the patients’ illness, and suppresses patients when they are going to express their life worlds. But in an effective communication model, doctor and patient are at the same level of authority and patients have enough time and allowance to express their life worlds (Bary, Britten, Barber, & Bradley, 2001).

The concept of the organism’s lifeworld is defined in different school of thoughts with different names. Virtually, the same idea is represented by the concepts of the phenomenological lifeworld, of biosemiotics’ signification sphere, and of the Uexküllian Umwelt (Sonesson, 2006).
Søren Brier in his forward to an issue of the journal *Cybernetics and Human Knowing* (CHK) devoted to Thomas Sebeok wrote:

With his [Sebeok’s] support the interdisciplinary effort of CHK grew to include the investigation of overlapping interests in the study of circular processes of signification and communication in both second order cybernetics/autoopoiesis and biosemiotics.

The point of departure for each is the life world of the organism. Peircean biosemiotics also includes the observer in its phenomenological view of signification.

With the active support of Jesper Hoffmeyer, Claus Emmeche, and Kalevi Kull biosemantic evolutionary views were introduced, and these contributed to the development of a foundation for cybersemiotics. There are clear overlaps between autoopoiesis, second order cybernetics, and Jacob von Uexküll’s concepts of Umwelt and Innenwelt. They all build on a self-organized, circular causality view of the organism and its life world seen as a whole. (Brier, 2003b, p. 5)

The importance of these concepts for medicine, in my view, is that in a clinical encounter, the doctor deals with all human modalities of communication which are described in the cybersemiotic model as three levels of communication and where the construction of meaning presupposes the involvement of all these modalities.

Wittgenstein in his first important book *Tractatus Logicus-philosophicus* suggested that “The solution of the problem of life is seen in the vanishing of this problem. (Is not this the reason why men to whom after long doubting the sense of life became clear, could not then say wherein this sense consisted?)” (Wittgenstein, 1922).

I think here that Wittgenstein points to this notion that, although language has an important role in constructing meaning, there are many other factors involved in meaning making which are in the territory of human knowledge but not necessarily science.

Søren Brier explains this as below:

It is clear from Wittgenstein that the human speech, its origin and meaning for the individual, can never be given a scientific explanation as such.

Humans have speech, meaning and knowledge before they make science. Science is about what we —in principle—all can agree about, so it can never explain the acts and meanings of the individual living being. Science cannot explain either the world, our consciousness or our language, but still it can describe—and even manipulate—some of the regularities/habits that are the necessary structures and organizational principles for living systems to communicate in and about worlds. (Brier, 1995, p. 10)

From a medical point of view, as George Engel (1997) truly suggested, the point is that language is the most important tool for scientific investigation in clinical medicine which can bring human aspects of patients into scientific inquiry. But it is critical to regard that there are other processes involved in the course of meaning making that are not categorized in the field of languaging but can be categorized in the wider domain of semiosis and are considered in the cybersemiotic model.

The other point is that I think production of new health for a person (which I have discussed about previously) is actually creation of a new meaning in their life and this can be done via languaging.
**Umwelt and Placebo Effect**

The term *placebo* originally comes from a Latin word which means “I shall please.” It was first used in the medical setting in eighteenth century to mean a medicine that pleases a patient rather than giving real benefit. The modern concept of placebo effect meaning an actual change in the illness status induced by the medicine’s symbolic value evolved only in the last century (Cavanna, Strigaro, & Monaco, 2007). The placebo effect is currently understood by the medical community as a healing response induced by nonspecific verbal or behavioral procedures that operate through the patient’s belief in the therapeutic power of the placebo (Cavanna et al., 2007). Benneditti and his colleagues believe that the study of placebo is virtually the study of the psychosocial context in which the patient is treated. We may have single placebo effect or many in a single patient.

The public is interested in placebo effects because they promise increased self-control; the existence of placebo effects suggests that we must broaden our conception of the limits of endogenous human capability.

Scientists are interested in placebo responses because the effects of belief on human experience and behavior provide an entry point for studying internal control of affective, sensory, and peripheral processes. (Benedetti, Mayberg, Wager, Stohler, & Zubieta, 2005, p. 10390).

In controlled clinical trials, when the aim is to evaluate a drug’s effect, researchers give placebo to control groups to eliminate the unwanted therapeutic effect of placebo. But here I think that there has not been enough research about the ways by which we can amplify the placebo effect and control it in a semiotic way. I think the main reason for this is that placebo effect is mainly based on so called “soft data” and researchers using traditional methods of research generally do not like to deal with this kind of data.

This notion can be traced in their paragraph below under the title “Placebo Response or Placebo Effect”:

This is perhaps one of the most difficult of all topics, especially with subjective outcomes such as pain or depression.

If we were discussing a topic like myocardial infarction and our outcome measure was death, then we might be reasonably sure that a placebo would have no effect on the outcome. But with subjective outcomes like pain, we might guess that patients would feel better after placebo, and consequently have less pain, if the doctor or nurse was nice to them, or appeared authoritative, or if the placebo was given as a big red capsule instead of a tiny white pill, or as an injection and not a tablet. Whatever we think, proving that any or all of these influences had an effect would be difficult because very large trials would be necessary to show any effect independent of random chance. (McQuay & Moore, 2005, p. 156)

But in my view, if the research method is not appropriate to determine the exact details of an effect, we should change it and simply increasing the number of cases cannot solve the problem.
Hence, I think here again the concept of Umwelt is helpful. If we define patient’s self based on their Umwelt in the process of healing we may achieve a better understanding of complex processes like placebo effect.

**Primary Care and Medical Ethics**

As I mentioned when doctors want to encourage people to modify their lifestyle (to stop smoking, to eat less or to exercise) they should be able to explain why they should bear the suffering of this change. It means that they should help them to find a meaning for this change. But I think before that doctors themselves should be able to explain for themselves why a healthy lifestyle is meaningful because they will not be able to help others when they need help themselves.

As a result, doctors in the course of their training need a period of self-reference. They should have reflections on their lives and they should think and study about concepts like the meaning of life, death, suffering, and so forth. As these concepts are not dealt with in the sciences, then they should study philosophy, ethics and other branches of the humanities.

If new findings in cognitive sciences, like the function of the central nervous system, and the limits of human understanding, were taught to medical students and the ethical results of these teachings were considered, then the rationale of philosophical discussions in medicine would be more understandable.

Von Foerster (1992) describes two different relationships between an individual and the world. The person may be considered an independent observer or an active participant. In the first position he or she tells others how they should behave and think. Von Foerster believes that it is the origin of moral codes. In the other position, the person is an active participant and because of this participation he or she can only tell to him- or herself how to think and behave and it is the origin of ethics. Nowadays, there are many medical universities in which courses about medical ethics are taught but as Von Foerster argued, because of the current view in medicine (which is based on a common philosophy of science), these courses are in the category of moral codes and they can not help construct a kind of in-context ethics.

By contrast, I believe that if medical students can reconsider their mechanisms of understanding and become aware of their deficiencies, their idea about outside reality will change and they will consider themselves as active participants in constructing the society’s state of health.

When this kind of science based on this new philosophy is taught and learned, not only do new horizons and spaces emerge, but also the people who think in this atmosphere will become ethical as a consequence.

Von Foerster explained this concept beautifully:

Second order cybernetics opens a space for reflection on one’s own behavior and enters directly into the territory of responsibility and ethics. Based on the premise that we are not discoverers of a world outside ourselves, but inventors or constructors of one’s own reality, all of us and each of us is totally responsible for their/our own inventions. (Von Foerster quoted in Jutoran, 1985, p. 18)
As Foerster explains (1990, p. 5) to have an in-context ethics we should emphasize on two main topics; one is dialogics and the other is metaphysics. In the cybersemiotic model one important notion is socio-communicative language games in which the part of dialogics can be well explored in the context of health. Metaphysics can be explored in phenosemiotics and a person’s metaphysical conceptual signification and its relation to their health is a matter of consideration.

Hence language is an important and powerful tool for constructing an in context ethics. Furthermore as I mentioned earlier that as George Engel suggested (Engel 1997), it is also the main tool for performing scientific investigation in clinical medicine. I think that in the paradigm of biomedicine the importance of this is neglected.

**Culture, Communication and Treatment**

Von Foerster in his lecture “The Cybernetics of Cybernetics” (Forester 1979) spoke about three important concepts. They were: observer, language and society. These are the very important concepts in the process of communication between doctor and patient and also in the “construction” of concepts of health and disease in different societies.

As Emmeche suggests, we can consider different forms of embodiment in different levels of the human being as follows:

1. The body of physics: dissipative self-organizing structures.
   (b) The body of sociology: a “cybody” i.e. a societal body dependent upon technology, embedded in a civilization. Cosmopolitics, hybridicity, posthumanity.
   
   (Emmeche, 2007, p. 258)

As Emmeche emphasizes (2007) it is important to consider that these levels of organization do ontically exist and from the medical point of view, each level has its own diseases and illnesses. We should be aware of upward and downward effects in the levels of hierarchy, and also we should regard the fact that we cannot reduce all the events in upper levels to lower levels.

Different cultural properties like rituals, religious beliefs, customs and habits can change the concept of health and disease. Then for successful management of health status of a society all these points must be regarded. In figure 5 which summarizes the cybersemiotic model, the two persons can be regarded as doctor and patient, and all the processes shown as involved in their communication can alter the process of
healing. But because in the biomedical model of today’s medicine the knowledge about these processes are categorized as “soft sciences” (Adler, 2000, p. 1), there has not been done enough research about them. But it seems that new advances in the understanding of human understanding may help us to think about the health of the human in a new way.

Also we can regard these two persons as the members of the community and based on their common concepts which are defined in their culture, beliefs and common mindsets, their concept of health and disease is constructed.

Considering this point as Uexküll and Wesiack (1997, p. 36) mention, each society defines its own illnesses and needs its own cultural medicine, and it is this kind of medicine that can solve the problem of culture-related syndromes which are problems not mentioned in modern western medicine nosology.

In this terms we can also think about the concept of production of health developed by Aaron Antonovsky. He described this concept in the term of salutogenesis. Actually using language and semiotic tools we can create spaces in which people’s sense of coherence becomes amplified (cited in Pauli et al., 2000c, p. 181).

Then for a true understanding of the concepts of health and disease we should gain a comprehensive image of their cultural background, the language games in which these concepts are constructed, and the mechanisms by which we can change and control these beliefs and correct behaviors related to them.

**Conclusion**

Health is a key concept in human life. It may seem easy to define health but in practice it is a difficult task, because human beings are complex and multi-dimensional creations and when we want to define their health, we should regard all these dimensions. Because of our limited knowledge about human nature, we cannot give a comprehensive definition of human health, but we should try to think about as many aspects as we can know and give a definition based on them. In modern medicine the main focus is on physiological and biological aspects of human existence and hence it can not deal with the complexity of human behavior and function optimally. Then as I outlined above, the cybersemiotic model can be used for defining a new framework for medicine based on which new practice and research can be constructed. To substitute our perspective with such an interdisciplinary framework, I think we should go through the following steps:

1. Showing the deficiencies of the current paradigm, and the data and the results of observations that can not be explained in the current paradigm, and showing how the new paradigm can be used instead.

2. Defining a new philosophical foundation based on the cybersemiotic model and defining key concepts like health, disease and illness according to a cybersemiotic understanding.
3. Designing a new curriculum for medical education and finding new research methodology based on this new paradigm.
4. Changing medical practice methods based on this new knowledge.

It is worth mentioning that in this framework all previous knowledge gained by the efforts of scientists is honored.

Obviously, formulating such a framework needs the help of experts from different disciplines and I hope we can together attempt to expand our vision about human health in a creative and generative manner.

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