Biopsychosocial Medicine

The Theoretical Basis of Multidimensional Parallel Diagnosis and Therapy

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Human Medicine – just like every other science needs a theoretical framework, which encompasses not only its main subject but also the general understanding of this subject. The *Biopsychosocial Model* currently offers the most comprehensive background theory for scientific medicine. The most powerful version of this model may be called a *body mind unity-theory* (or more precisely: a brain mind unity-theory *or* organic unity theory). This theory stresses an one world perspective, using the General System-Theory and overcomes the dualistic concept of psychosomatics (Egger 1992, 1993, 2005). The term *biopsychosocial model* was first used in medicine by George Engel, but there are a number of other prominent representatives, who have contributed significantly to the evolution of this theory over the last 4 decades. They all were not content to accept the boundaries and limitations of the leading biomedical theory (Engel1976, Lurija 1992, Weiner 2001, Kandel 2006).

The Biopsychosocial Model

as a theoretical framework for an integrated scientific medicine
based on
the body mind unity theory

Ludwig von **Bertalanffy** (General System Theory) et al.
George L. **Engel** (original paper 1977)
G. E. **Schwartz** & P. **Weiss**
(behavioral medicine, neurophysiology)
A. **Goodman**
(organic unity, utilizing Spinoza's body-soul-identity)
Herbert **Weiner**
(the human organism as a functional unity of body and soul)
Eric **Kandel** (neurobiology, interdisciplinary network)
Th. v. Uexküll, W. Wesiack, A.R. Lurija, H. Petzold …

Figure 1

The biopsychosocial model – or better: the body mind unity theory – is not in opposition of the biomedical model, which has dominated this field until now. The long and successful story of the biomedical model, with its strong physical-chemical basis is still recognized within the new framework. But the biopsychosocial approach attempts to open our scope by calculating psychological and eco-social factors as a strong impact for health and disease. Such an undertaking – that means the parallel use of physiological, psychological and enviromental influences – needs of course a potent metatheory (Egger 2000, 2012, Kriz 1997, Foss & Rothenberg 1987).
Within this new understanding health and illness are no longer seen as two different entities, they are not dichotomous or separated from each other. The General System-Theory postulates parallel levels of reality, therefore it makes no sense to make a strong difference between "healthy" and "ill". A person can function more or less normally on different levels at the same time. It also does not make much sense to differentiate between an organic and a psychological (or mental) disorder – these are only phenomenological perspectives (Goodman 1991, Petzold 2001).

"There is nothing more practical than a good theory"

Biopsychosocial Medicine

and its theoretical basis:

body mind unity theory
Theorie der Körper-Seele-Einheit
or
brain mind unity theory
Theorie der Gehirn-Geist-Einheit
or
organic unity theory
Theorie der Materie-Geist-Einheit

Figure 2

As we pointed out in our Venice Declaration (2010): "As a matter of fact, General System-Theory provides a model that suggests the concept of a parallel interface between different dimensions of reality. The idea of a strict differentiation between "ill" and "healthy" is no longer viable. Within each different dimension of a general system – biological, emotional or eco-social – an individual may be functional to a greater or lesser extent. Also, the distinction between organic and psychological disorders does not appear justifiable anymore with-

in the spectrum of disorders. Therefore, the differentiation between psychosomatic and non-psychosomatic illnesses and even the concept of psychosomatic illness itself have become obsolete." (www.bpsmed.net)
One crucial point is, that for diagnostics and for therapy all three relevant levels – id est physical, psychological and eco-social level – have to be investigated and considered in a parallel approach. All three levels belong to the same reality, even if they are investigated by different methods, different conceptions or different terminology. All three levels constantly interact with each other. All forms of life interact with their specific environment: The gene-expression of each organism reacts to changes of life environment. Our body-organs react in complex interaction to the specific changes of the biochemical milieu within our organism. We – as individual persons – react permanently to changes of our social and ecological environment (Egger 2008, Uexküll & Wesiack 2003).
Every *event* runs – due to the vertical and horizontal networks – more or less *simultaneously* on the different system levels. This phenomenon may be technically described as parallel interface (in German "parallele Verschaltung"). However that does not mean that all effects can be observed at the same time. Due to the different progression of processes on each involved system level, some effects will develop faster, while

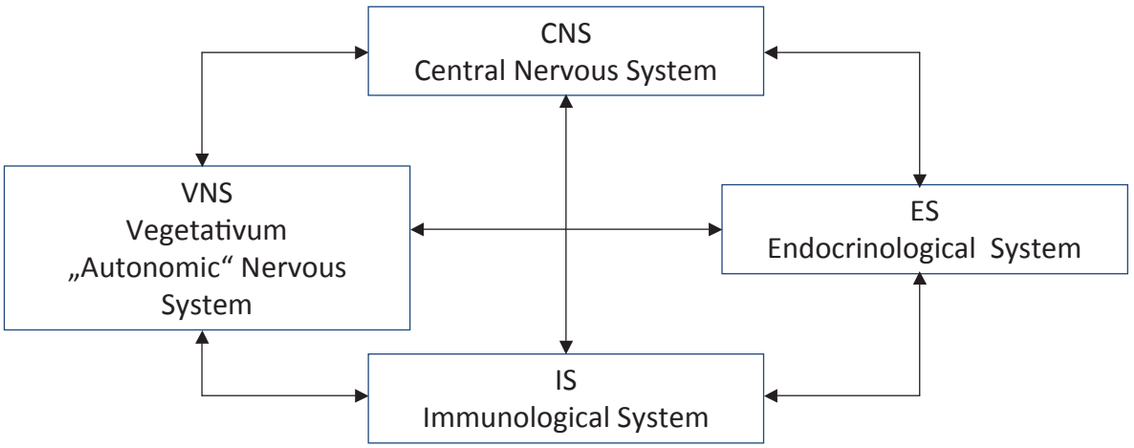

Figure 3

Biopsychosocial scheme

Simultaneous diagnostics and simultaneous therapy
(parallel gathering and utilizing of data)

Level of observation	DIAGNOSTICS	THERAPY
biological somatic aspects, biomedical data	etiological and pathogenetical aspects, risk factors …	physical, pharmaceutical, surgical interventions …
psychological pt's individual experience and behaviour pattern („personality"), individual life style	personality factors, coping strategies, compliance …	enhanced doctor-patient-communication, psychological training, psychotherapy …
eco-social family and social network, professional aspects, physico-chemical environment	social support, significant life events, profile of life stressors …	information, self help groups, psycho-social communities …

Figure 4

others only can be observed with delay. As an example we could consider the long exposition to cigarette smoking before a lung cancer occurs, or the latency between psychological stress exposition and gastric ulceration.
It is important to mention here that we do not get an adequate insight or understanding of a process by collecting data only at one system level. There will be new phenomena on the next higher level that we could never observe on a lower system level. In other words: even the greatest of efforts within the levels of neurology or biochemistry will not be able to describe the phenomena of personal experience or individual behavior – and this is also true vice versa. The explanation to this is that each higher level produces phenomena, which do not exist in the level beneath.
For instance, we never would find psychological phenomena like "insecurity", "animosity" or "self efficacy" on the physiological level. What we could find there are a manifold nervous, humoral or biochemical patterns which cannot be interpreted without the knowledge of their psychological function.
Another implication of the biopsychosocial model is, that all events or processes contributing either to the etiology, to the pathogenesis, to the symptomatic manifestation or to the treatment of disorders, are consequently not either biological *or* psychological, rather *simultaneously both* biological *and* psychological.
Every psychological phenomenon – that means every thought, every feeling, every impulse for action or every action itself – is at the same time a physical event as well. Our common language creates the appearance of two independend or separated worlds – a world of body and a world of mind. However there is only one unified *process.*
For the scientific research we have to consider that there is no chance to study a disorder as a single entity with all possible factors involved (in German: "das Ganze an sich ist nicht untersuchbar"). Therefore, also in the field of biopsychosocial approach researchers are preferred to examine smaller areas of a disorder – dependent on the special interest and expertise of the researcher. Nevertheless he or she has to incorporate his/her findings into a more general biopsychosocial framework (LeDoux 2001).
Although there is no stronger or more potential theory for the scientific medicine we have to face some critical aspects concerning the biopsychosocial model. The continuing and yet unsolved problem is, that we have no common terminology for

PATIENT in his/her INDIVIDUAL WORLD *needs to be described in their psychological dimension, biological dimension and eco-social dimension*				
biopsychological diagnostic ("simultaneous diagnostics, holistic or multiple-level diagnostics")	biological data	data on the patient's experience and behaviour (cognition, emotion, behaviour)	eco-social data (physico-chemical and social environment), functional aspects	multidimensional & multimodal acquisition of data, levels and sources of data
integrating data collected in multiple-levels diagnostics integrating data using disorder-specific models describing links between various levels of the system (scientifically proven or assumed interfaces between relevant systems) **multimodal therapy** applying and coordinating interventions on various levels guided by biopsychosocial diagnostics, treatment concept with multidimensional options for intervention				
biopsychological therapy ("simultaneous therapy", "holistic or multiple-level therapy")	interventions at the biological level: pharmacotherapy, surgery and technical interventions, physiotherapy	interventions at the psychological level: cognitive-emotional and behavour-oriented psychological interventions	interventions at the eco-social level: family and professional network, socio-cultural resources	balanced interventions, serial or parallel method of delivery
effects on the psycholocial, biological and eco-social dimensions of the **PATIENT** in his/her INDIVIDUAL WORLD				

Figure 5

the physiological events on one side and for the psychological processes on the other. We are able to realize the parallel organized processes of a disorder but we still describe these findings with two different languages or terminologies in medicine: We describe them with biomedical terms on the one hand and with psychological terms on the other hand. In this field we still have to make great efforts, a work, which can only be resolved in interdisciplinary teamwork over the years. Our linguistic system – and therefore our thinking system – is based on a dualistic terminology and lets us believe that we have two worlds: the material world of the body and a somehow strange world of the soul or mind, with no clear idea how they should belong together. But there is only one world (Windmann & Dustewitz 2000).
What we can say at the moment is: Whatever may be described by the rules of physics and chemistry belongs to the material world, and all events best described by the rules of psychology belong to the world of soul or mind. But both they belong to the same reality and are only separated by our current use of terminology and our traditional way of thinking.
Almost all processes in nature – and also within our own organism – are non-linear, and potentially of chaotic type. The more variables involved in a process the more unpredictable the connected event. A degree of uncertainty will always remain in all our models. We can reduce this uncertainty to a certain degree by systematic research but we can never eliminate it completely. Whoever denies this, seriously underestimates either the number of variables or their effect in non-linear processes through interdependencies or cross reactions. The person as a non-linear (chaotic) system can never be fully understood within a causal-linear or "if-then"-relation.

Main questions about the multi-perspective data integration and treatment

(1) **Biopsychosocial model of a disorder/illness**
How can we integrate the collected data from the biological level (medical data), psychological level (reported complaints) and eco-social level (pt's environment) to a holistic understanding?

(2) **Possible ways of interventions**
What kind of interventions may be drawn from the biopsychosocial model (ex 1) on each of the 3 levels (biomedical, psychological, eco-social)?

(3) **Individual treatment**
Which of the possible interventions (ex 2) may be the most important to start with?

Figure 6

For research, just as for the practical daily work, it is important to accept that we cannot investigate all aspects of a disease – we even do not know what the whole entity of a disease could be. For empirical research we have to deal with simplified linear or if-then relations. But we have to remind ourselves, that the linear-causal models are strongly reductional approaches, which can only explore some parts of the involved factors. Disorders or health processes are multi-determined and correspond to non-linear chaotic processes. What we can do is to study the risk- and protective profile, the intercorrelations and interdependencies, as well as the repressive or challenging factors within these processes on all three observation levels: the physiological, the psychological and the eco-social aspects. The theory of the *body mind unity* extraordinarily stresses an interdisciplinary research (Egger 2012).
The controversial discussed "Genom project" has brought out a phenomenal finding wherein the genetically determined individual does not exist as such. It is much more a "work in progress". The human organism is seen as a "biological mosaic". The long discussion therefore which of the two – genes or environment – holds greater importance, becomes irrelevant. Whatever is genetically expressed, is greatly dependent on the immanent environment, including its social life conditions. The genetic "world within" and the individual "world outside" build one functional unit (Kandel 2006, Roth 2003).

The biopsychosocial understanding of illness as a leading topic for education in human medicine

3 major aspects of applying help in medicine

WORD	DRUG	KNIFE
communication, psychological factors	pharmaceutical factors	technical/ surgery factors

Antic healing arts sensu Asklepios (Äskulap):
First heal with words, than cure with drugs,
finally treat with knife

Medical science sensu Biopsychosocial Medicine:
Find out what's the best help for your patient and treat him with all adequate tools – i.e. be able to use words, drugs, and knife simultaneously

Figure 7

To resume: For the daily work in biopsychosocial medicine it is not important to be an expert in all relevant levels of a disease. It cannot be expected to be both an expert on *hard core medicine* of a certain disorder and be an expert of psychology on individual experience and behavior of a person or even a specialist on the eco-social correlations of a disorder. However to practice biopsychosocial medicine, an elementary knowledge of the other terminologies is necessary: The medical doctor needs a basic understanding of the psychological and eco-social variables. The clinical psychologist on the other hand needs a basic understanding of the most relevant biomedical aspects of clinical disorders at hand. Only if we can achieve an overview of the potentially involved factors on the different

levels of observation we can build a useful mosaic for biopsychosocial research and intervention. Otherwise all the variables on the higher or lower system levels and their interactions will appear strange or even irrelevant to a special expert.
As pointed out in our Venice Declaration (2010): "A medical doctor operating in the world of somatic medicine can find all the relevant aspects and tools needed within the world of the biopsychosocial medicine. These data will however be updated with information about the psychological and eco-social status of the patient, which all can be assessed in a parallel way as an "simultaneous diagnostic procedure". From such deep understanding of a disorder one can deduct definitive ways of intervention both for the biological, and for the psychological and eco-social levels of the individual patient (that means a "simultaneous therapy" or parallel interventions). The investigation spectrum of medicine will expand through this approach and the psychological and eco-social aspects of the disorders will not be out-sourced.
It is not expected, that this biopsychosocial competence will gain wide acceptance in medicine in the near future, and that the work of professional interdisciplinary teams develops into a feasible and timely practice. This approach has another significant advantage over the current practice: the specialists involved can learn for each other and also the patient benefits most by receiving a management with the lowest possible risk for mismanagement."

Biopsychosocial Medicine means teamwork –

it needs the **communication** between doctor and patient, between all health professionals, between medicine and society

Figure 8

Biopsychosocial Medicine needs the cooperation within a multiprofessional team. This is true for research and for the patient's treatment as well. That's why I am glad to be here with you, to be part of such a teamwork! – Thank you!

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