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Subjectivity and illness

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Despite long-standing research, many diseases remain without adequate pathophysiological explanations or effective treatment. Most likely, the discrepancy between efforts and results can be ascribed to reluctance on the part of biomedicine to recognise subjective experience as a causal factor.

The main question, how anything in the world can have a subjective point of view, remains unanswered (1)

Thomas Nagel

Many diseases, including infectious diseases, cancer, autoimmune and mental disorders, have predisposing, precipitating and perpetuating causes that are of a biopsychosocial nature (2). The epidemiology and course of these disorders may thus change because infectious, stress-related and mental strains affect the body's adaptive systems, including the immune system, central nervous system and the endocrine system (Figure 1).

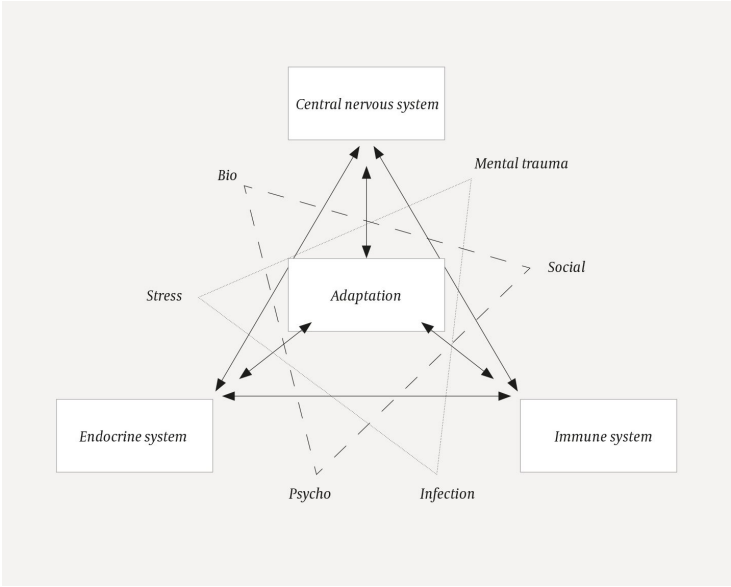

Figure 1 *The body's adaptive systems respond to signals that are of a biopsychosocial nature, such as stress, traumas and infections. The systems interrelate with each other and the environment, and provide the body with a first-person perspective on the world. The systems thus help the body adapt to the environment.*

Our understanding of exactly how these changes are transformed into disease in predisposed individuals varies for different categories of diseases. The better the disorder in question can be modelled mechanistically, the better it can be explained.

The fact that even good explanations may be incomplete can be highlighted by attempting to predict the development of disease in patients with identical diagnoses – the reasons why some individuals fall fatally ill from a streptococcal or influenza infection, whereas others barely develop symptoms, are only partly understood. The same applies to cancer – while some patients develop breast or prostate cancer with a fatal outcome, the disease regresses or stabilises in others.

One answer to these variations in disease development and prognosis is that different patients manifest different adaptive competence – meaning that they vary in their ability to optimise the protective mechanism and thus eliminate the threats without causing harm to themselves (3, 4).

Adaptive systems

Adaptive competence is communicated by way of adaptive systems. These consist of interacting components that exchange experiences with their environment and adapt their internal structures to the nature of the external influences. When encountering infectious agents, for example, the cells and cytokines of the immune system will provide protection by dynamically adapting to the pathophysiological process and thereby defeat the infectious agent's ability to proliferate and spread.

When one type of element changes in quantity, the quantity of other elements also changes. Thereby, the relationship between the elements is altered as well. These changes will rarely be of a linear nature, and the absence of proportionality between the cause and effect means that small alterations in initial stages may produce large effects in the later course of events. In turn, this may give rise to behaviour that cannot be ascribed to characteristics of the individual component, but pertain to the total behaviour of the system (5).

Moreover, the changes may give rise to complex dysfunctions that cannot easily be understood by analysing the individual components separately. Thus, disease is not only a matter of absent or defective individual components; it may equally well involve dysfunctional relationships between elements.

A crucial aspect of adaptive systems is their ability to help integrate the organism with its environment. They make decisions and 'choose' a response on the basis of evolutionarily selected regulation mechanisms that are honed through the life experience of each individual organism. Such learning systems gain a perspective on the world – they interpret the world from a subjective point of view imparted by previous life experiences. This makes the adaptive competence increasingly unique to each individual.

The researcher may interpret the system's response from two different perspectives: the response can be regarded as conditioned by mechanistic reactions or as a decision based on the system's weighted interpretation of stimuli. In the former perspective, the task of science is to capture the system's regulatory mechanisms; the latter perspective implies that the researcher also needs to obtain insight into the system's perspective on itself and its environment.

Since this perspective comes about as a consequence of the system's learning interaction with its environment, Thomas Nagel's (1) question – 'how anything in the world can have a subjective point of view' – can be answered in natural ways. How to obtain access to the system's subjective perspective, how the researcher might be able to capture the system's

first-person perspective from his or her own third-person perspective – for example to recognise somebody else's pain the way the subject itself feels it – remains unsolved, however.

The positivist ideal – subject-free science

The term subjectivity – understood as the counterpart to objectivity – resonates poorly with science. Methodological prescriptions therefore seek to eliminate the patient's and researcher's subjectivity. However, this elimination process may occasionally be only tenuously justified.

The researcher needs to avoid a *subjective description* of experience, but this does not mean that the researcher should avoid providing a description of *subjective experience*. Where the former description leads to misunderstanding, the latter gives rise to deep insight (6). Such insight into the subjective will be especially valuable in cases where adaptive systems contribute significantly to pathophysiological processes.

The prescription that researchers must avoid bringing their own subjectivity into the study can hardly be fully complied with. This was made evident during the Norwegian positivism debate in the 1950s and 60s.

The debate was started by Arne Næss's (1912–2009) doctoral thesis from 1936 (7). He wished to show that knowledge of the actions of others can be gained without assuming a knowledge model in which the researcher's subjectivity contributes to the knowledge outcome. For this purpose, he found it necessary to develop a method that could capture the reality – the 'positive' – of the observed person's behaviour, assuming that functional behaviour as perceived by a non-biased observer could lead to this goal.

Hans Skjervheim (1926–99) later challenged Næss's assumptions by showing that neither the researcher's, nor the observed person's subjectivity can be fully eliminated, and moreover that any attempt at such elimination would reduce the researcher's opportunity to obtain a correct understanding of human dispositions to act (8). Næss appears to have subsequently incorporated Skjervheim's objections (9).

In a medical context, Christopher Boorse has sought to revitalise the positivist ideal by highlighting that biological function may serve as a value-neutral demarcation criterion between health and illness – health is present when all bodily processes function normally, measured in terms of a healthy reference group matched for age and gender; illness means that these processes function less well than expected (10).

With regard to adaptive systems, this is an erroneous assumption. Adaptive systems surely develop from genetic structures that are constituted at the moment of conception, but their functional form is established only through the system's self-creating interaction with the environment. Health and illness may thus be realised in multiple ways – for example, monozygotic twins develop different adaptive systems, and as shown for the immune system, these differences may even increase over the course of life (11). Such differences reflect the changing realisation of subjectivity throughout life, and also profess that adaptive functionality should be regarded more as a relationship between the organism and its environment than as a property of the organism itself.

This kind of understanding implies that illness may occur as a result of changes in the environment as well as in the organism, and there may therefore be little relevance in equating illness with dysfunction, as advocated by Boorse. It is possible to have a fully functioning immune system and still develop cancer, allergies, autoimmune diseases and chronic infections.

Insufficient recognition of the pathophysiological influence of subjectivity may perhaps be the reason why certain complex diseases – including chronic fatigue syndrome – remain unexplained (12). In this syndrome, there are no biomarkers that can distinguish the ill from the healthy, and the diagnosis is therefore made on the basis of the patient's subjective

experience of his or her bodily functioning.

This is the same subjectivity by which patients and controls are included in research studies. Subsequently, however, the researcher largely neglects the importance of subjectivity in favour of objective measurements of cellular, molecular and functional parameters, despite the fact that there is widespread agreement among researchers that the syndrome is associated with the function of adaptive systems and that 'basic research linked to infections, inflammation, immunology, neurology and genetics' ought to receive support (13).

The return of subjectivity

Boorse's argumentation was based on the same mechanistic understanding of the organism that was applied through the modern evolutionary synthesis of the 1930s. The synthesis came about when biologists linked Charles Darwin's (1809–82) concept of natural selection with Gregor Mendel's (1822–84) genetics. This made it possible to explain evolution as a consequence of genetic mutations and recombinations.

The gene, as the object of change, and the population that develops through changing gene frequencies, thereby gained hegemony as the main biological players. Thereby, the organism could be regarded merely as a survival machine for the genes, to use Richard Dawkins' powerful metaphor (14).

To the biologist Jakob von Uexküll (1864–1944), such an understanding of the organism was alien. As his basis, he took Immanuel Kant's (1724–1804) assertion that humans invariably perceive the world from a subjective point of view, and pointed out that animals are acting subjects that are guided by their relationship with their environment. In other words, they are not passive objects governed by mechanical laws. The animal perceives meaning in its environment, and is enabled to act in accordance with the situation by its first-person perspective (9, 15).

As the 1980s progressed, it became increasingly clear that the modern synthesis had its faults, and that the exclusion of the organism and its subjective perspective on the world also excluded significant aspects of lived life (16). This also invalidated the machine metaphor – the proclamation was that if the organism is robbed of its subjectivity, it is also robbed of life. A similar claim about machines is meaningless (17).

From the 2000s onwards, this shift in perspective led to new biological explanations, and the need for an expanded evolutionary synthesis with the organism as its axis became increasingly apparent. However, as in all scientific paradigm shifts, this one also gave rise to conflicts. A struggle for hegemony continues to unfold between the adherents of an expanded synthesis and researchers who claim that the modern synthesis may accommodate this new understanding (18).

Nevertheless, both camps share the understanding that the organism needs to be incorporated as a significant actor in biological explanations. Thereby, the subject and subjectivity are also made relevant for biological theorising (19).

Investigating subjectivity empirically, not only theoretically, has proven difficult, however, in spite of the enormous development in technology and knowledge that has occurred over the last 20 years. This development has enabled us to collect huge amounts of data from the body's adaptive systems, and increasingly clear contours are being drawn for how personalised medicine may be practised (20). To date, however, we are still unable to clarify the first-person perspective of adaptive systems by way of empirical measurements.

This imbalance between ambition and realisation is exposed most clearly in the study of the relationship between brain activity and subjective consciousness, in which researchers have not yet been able to explain how communication between neurons produces conscious thoughts (21). In all systems the challenge remains the same – how to analyse subjectivity based on measurements of individual components that possess no subjectivity of their own.

To the practitioner, this lack of clarification means that medicine cannot be fully personalised, that the encounter with the patient cannot be reduced to technological imperatives and formula-based assessments, and that proper medical thinking needs to be applied (22).

A new debate on positivism – now?

The claim that adaptive systems exhibit subjectivity ought to be uncontroversial. Biomedicine has nevertheless been reluctant to allow the application of this knowledge in research.

A debate on positivism in the manner of Næss–Skjervheim might help create a new understanding of the influence of subjectivity on organisms' disposition for action. This could take the development of a theoretical foundation for the empirical investigation of pathophysiological processes one step further.

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