

Summary

This study, consisting of four parts, focuses on the fundamentals of psychopathology from a systemic, a developmental and an evolutionary perspective. The first three parts (comprising chapters 1 to 7) have in particular a fundamental, philosophical approach; the fourth part (comprising chapters 8 to 10) has a more applied orientation.

The research into the backgrounds of mental disorders and the deviant behaviours that are involved is of great importance for humanity. A significant proportion of frequently occurring and chronic disorders are linked to disorders that are associated with brains or behaviour. Moreover, we should realise that mental problems can lead to somatic disorders, as conversely the opposite often also occurs. The personal suffering for the patients and their relatives is enormous, and the costs for the relief and treatment of the directly-affected people are substantial. Unfortunately, in a curative respect there are few possibilities to effectively reduce the prevalence of these health problems.

Chapter 1 discusses the historical and present-day context of this study and highlights the lack of advance in the development of efficacious treatments of humans with a mental disorder, partly because of the insufficient knowledge about the determinants and mechanisms of psychopathology.

Initially the chapter discusses the endeavour for treatments on the basis of scientific evidence, the aim of care, the relationship with other disciplines (especially between the psychiatrists and the psychologists), and the question whether we have to evaluate the speed of progression as positive or negative. Next, the historical context is discussed. The history of psychiatry, the medical discipline that is concerned with the treatment of mental disorders, is characterised by various dramatic events (both positive

and negative) that have influence until today. In addition several other themes are discussed: the humanisation of care, the rise of psychopharmacology and the idea of rehabilitation, the schisms in the relationships with psychology and neurology that occurred in the past, and the continuing problem of finding a suitable classification system for mental disorders.

Chapter 2 concerns the starting point for this study, its objective and the questions raised by the study. The central questions are: (1) is the philosophical-theoretical system as developed by Mario Bunge appropriate for the conceptualising of psychopathology and the research into the determinants and their mechanisms?; (2) what does this theoretical system mean for the conceptualising of psychopathology and for research and diagnostics?; (3) what are the consequences and the implications of that conceptualising for (the assessment of) common research into psychopathology and the actual diagnostics thereof? This chapter justifies why (in answer to question 1) the works of the philosopher Mario Bunge are selected as the starting point for this study.

Chapter 3 examines the background of Bunge and discusses some major items of his philosophy, as well as his ideas about the contribution of science to philosophy. As a general introduction to the philosophy of Bunge, the triple ‘-isms’ that are central in his ideas are addressed: systemism, materialism and realism. Systemism refers to the approach of reality as a system of systems. Materialism is related to views about the most general features of the world, conceived as the totality of things. Realism is especially concerned about doctrines on the recognizability and also the manipulability of the world. Systemism, materialism and realism are narrowly linked (in a supplementary way) to each other. Further, this chapter examines Bunge’s concepts of determination, determinants and mechanisms, what the differences are, how these concepts are related with each other as well as with the concept of law or lawfulness, *and* what the relevance of these concepts is when giving a scientific explanation. Chapters 6, 7 and 9 contain supplementary clarifications about his ontological and epistemological ideas.

The human being is a biomenal system that lives and develops in a social and cultural environment. Chapter 4 focuses on the

biological dimension. It examines the philosophy of biology that Bunge has elaborated together with Mahner. Wherever possible and relevant it is examined where and how the (empirical) disciplines that are oriented on facts connect to this body of thought. Biosystems are dynamical; in different areas of this the triple take *operation* (current processes), *development* (ontogenesis) and *evolution* (phylogenesis) is used. Thus this chapter examines specifically the systems biology, the developmental biology and the evolutionary biology. Further, some themes are touched upon—for example heredity, the role of genes and environmental factors, and phenotypical plasticity—that further on in this study play an important part. Finally, the chapter examines functions and dysfunctions. The concept of function is a permanent source of confusion among evolutionary biologists. This study is connected to the proposals that Mahner and Bunge have made to bring the different interpretations of the concept function in a logical and ‘historical’ connection. There is also a connection to the ideas of Davies about the heuristic role of functions, and the proposals he has made to research functions of biosystems. Later in this study, his proposals play an important role in the research of psychopathology.

Chapter 5 is focused on the psychological dimension. After a discussion about Bunge’s ideas on the mind and mental functions, an examination is made into how the disciplines that are oriented on facts relate to this. Bunge has proposed, completely in line with his ontological and epistemological views, a hypothetical solution for the body-mind problem. The results of the neurosciences have an important role in this hypothetical solution. In summary, he argues for the *psycho-neural identity hypothesis*. This hypothesis is on the basis of the ‘neurobiological revolution’ in psychiatry which has promoted the combination of biology with psychology, and can be correlated with the ontology that is basic to all factual sciences. Further, this chapter gives an explication of Bunge’s views on psyche, mental functions, psychology and psychosocial neuroscience.

As the study of biosystems has to be placed in a systemic, developmental and evolutionary perspective, it should also be done when it concerns the study of mental capacities and functions. Therefore, this chapter examines some facets of the operation, de-

velopment and evolution of the human brain, mental functions and human behaviour. For the elaboration of different themes references are made to summarised publications.

For the discussion of the brain from the perspective of individual development this chapter examines modern 'paradigms' such as neuroconstructivism and biocultural co-constructivism. In both concepts the development of the brain's mental functions is seen as the emergent result of developmental processes. In biocultural co-constructivism there are three adjustments: internal adjustments to the autonomous maturation, adjustments of the individual to the environment *and* adjustments by the environment. These three types of processes are important for a comprehensive analysis of the origin of psychopathology; as points for attention they return in the heuristic model that is presented in chapter 7. Also, some characteristics of ageing are discussed as an aspect of development.

Evolutionary research concerning the brain and mental functions has, in addition to the technical research problems, to confront unsolved theoretical issues; in particular, evolutionary psychology has faced much criticism because of views about adaptation that does not fit with the perceptions of the theoreticians of evolution. The chapter discusses some aspects of the evolutionary approach to brain and mind.

In this chapter, and more generally in this study, the concept function has an important position, which is therefore the reason that some conceptual distinctions have been repeated at the end of this chapter. These are important when it comes to the definition and the research or the diagnostics of dysfunctions, as discussed in the following chapters. Themes are: mental functions and concept adaptation, the distinction between essential and non-essential functions, higher and lower functions and concepts such as functional organisation, functional integration and functional integrity. Also the qualitative and quantitative aspects of mental functions are briefly discussed.

Chapter 6 examines the conceptualising of disease and psychopathology. We are looking for knowledge about mental disorders of humans that we research as biosystems in a social and cultural context. To arrive at a philosophically consistent and coherent

definition of a disease, including mental disorders, that moreover fits with the bulk of scientific knowledge, it is important to study some basic concepts in relation to systems, and especially to explicate their underlying interdependence.

Firstly, this chapter continues the discussion of the major items of Bunge's ontology. Central are themes that are related to systems (general definitions, states and changes, and the properties of systems). It serves as a step to the conceptualising of psychopathology. We can approach a disease or mental disorder (conceived as a concrete form of psychopathology) as being at least four kinds of problems: as ontological, epistemological, ethical or moral, and as a technological (medical or psychiatric) problem. This chapter accentuates the first meaning; the second meaning is discussed in chapter 7.

A mental *disorder* concerns a disease process that is accompanied by specific dysfunctions of the brain and it reveals itself in a whole range of symptoms at the behavioural level; if this view is to have relevancy in research and clinical practice then more specific conceptual distinctions are necessary. This chapter focuses especially on the following concepts that—in this sequence—are the central theme in chapter 7 (which discusses research and diagnostics of psychopathology): symptoms, dysfunctions, determinants, and mechanisms.

Chapter 7 discusses the possibilities and difficulties in relation to scientific research and diagnostics of psychopathology. The starting point is an introduction to the epistemological positions of Bunge. The themes that are discussed here are related to what knowledge and the practice of science are in essence, the indispensable role of theory and hypothesis in that context, and what we mean by scientific understanding, evidence and truth.

Following Bunge, the research into mental disorders is conceived as the solving of 'inverse' or 'indirect' problems. Given the features of such problems, a four-step thinking model is presented for the direction research into mental disorders could take (assuming that we would start from zero). It is stated that in that context it is necessary to look *beyond* the symptoms for mental dysfunctions, seen as dysfunctions of neural systems, which are mostly still insufficiently mapped and investigated. Further, some heu-

ristic perspectives are addressed which can be helpful with this. In its main points the model states that, (1) after we have mapped clusters of symptoms, researchers (2) have to look for dysfunctions, and (3) for the systems that are involved with those dysfunctions (and their features, i.e. determinants), to focus (4) the search eventually to the discovery of the mechanisms in the systems that are related to the origin of those dysfunctions and symptoms. The four steps are applicable to a downward as well as an upward research strategy.

For the assessment of dysfunctions three criteria are proposed (dominance, robustness and harmfulness) that can play a role in determining whether there is a possibility of psychopathology. It is suggested that we can speak of mental disorder when one or more mental dysfunctions occur that are dominant, robust and harmful. This is an aid—‘for the time being’—because we know only for sure *that* there is a disorder when we have mapped the disease process, understood the systems that are related to the dysfunctions, and have identified the determinants and mechanisms. Thus, the criteria do not compensate for a lack of knowledge, but they do certainly play a heuristic role. If there is a clinical problem they help to answer the question: Is it plausible that an abnormal state is likely based on a disorder? The clinical relevance is supported by the fact that there are one or more dysfunctions: that one or more thereof are *dominant* structures the search process and is also helpful for the classification of syndromes; the *robustness* of the dysfunctions distinguishes between temporary distortions and durable psychoneural changes; the *harmfulness* of the dysfunctions are ‘value-bounded’ and by definition very intricate. This criterion is nevertheless very relevant: it summarises how the patient and the social environment experience the dysfunctions (in terms of ‘complaints’), and it predicts (because of the harm that already has developed and is possibly still in store) the outcome when, for example, effective treatment fails to occur.

In addition, because a mental disorder is related to multiple dysfunctions they can score differently on the three criteria. Therefore, in practice there is always a case of a complex mixed clinical image: some dysfunctions are robust, not dominant and also not harmful; others are harmful and dominant, but not robust, etc.

Thus it is difficult to make judgements about concrete disorders merely on the basis of the criteria. However, the criteria do not function as a substitute for the solution of an inverse problem, but as a first step in the demarcation of normal behaviour in relation to abnormal but not pathological behaviour, and in relation to abnormal and at the same time pathological behaviour.

Finally, the chapter also examines diagnosing in psychiatry. It is asserted that the connection of a number of manifestations of disease to a category in a diagnostic classification system is not a diagnosis. Here, the position is taken that although the individual diagnostician has fewer possibilities at his or her disposal than a scientific researcher, and moreover strives for other aims (application of knowledge versus production of knowledge), there are (or there should be) also many resemblances. Therefore, it is argued that the analysis in four steps and the heuristic perspectives that are proposed in this chapter are, in principle, also applicable to diagnostics.

Chapter 8, and the following chapters, focus on the consequences and implications for science and clinical practice of the views developed in the preceding chapters. This chapter discusses the hindrances for the classification of psychopathology that result from the current DSM, problems in connection with co-morbidity and differing diagnoses, and the separation of disciplines that stand in the way of adequate research and diagnostics. Also, the possibilities of a revision of the DSM will be discussed, against the background of the downward and upward approach of psychopathology that is proposed in the preceding chapter.

The discussion of some of the backgrounds to the DSM and its related critique takes place influenced by the work of Sadler, among others. In addition, some possibilities for improvement, including the contribution of Van Praag, are discussed.

The problems with the present diagnostics and the DSM are illustrated on the basis of the concept of co-morbidity—in psychiatry a source of confusion and misunderstanding. Because this term is used in clinical practice so often, is it important to discuss it, partly because on the basis of the discussion some earlier-stated positions may be clarified.

The problems in connection with the DSM apply to the clini-

cal practice as well as for scientific research. Scientists experience that the scientific value of their research is seriously undermined so long as the definitions on which the basis of cases for further research shall be selected are under heated discussion. Therefore, the question is relevant if an alternative to the DSM is possible. It is doubted if an etiological classification is feasible in the short-term; also, the proposal to use 'endophenotypes' for this purpose is rejected. On the other hand, the idea that a function-oriented classification can be invoked can be endorsed. On the basis of the 'downward' and 'upward' approaches that are proposed in chapter 7, research can contribute to a substantial improvement to the DSM.

Alongside the DSM the separation between the disciplines dealing with neural or mental dysfunctions is an impediment for the further development of psychiatry, and because of this, partly slows the improvement of diagnostics and the treatment of patients with mental disorders. An important background to the disciplinary separations is the traditional philosophical distinction between brain and mind. Here the distinction is between neurology and neurobiology on one side, which were oriented towards the anatomical structure and physiological operation of the brain (understood as a conglomerate of neurons and glia cells), and psychology on the other side, which was oriented towards the (brainless) mental functions. In the history of psychiatry both sides are taken, with the result that not only the relationship of psychiatry to the (clinical and/or neuro) psychology, but also the relationship of psychiatry to neurology, is complex. In this chapter the creation of interdisciplines is argued for.

Chapter 9 discusses current research into psychopathology and, where necessary, gives critical comments. It starts with the last of the introductions to the works of Bunge in which the relationship between ontology and epistemology is clarified. Themes that (again) are questioned concern the importance of theory and hypothesis for scientific research, the concepts emergency and level, and the possibilities and difficulties of reduction. This chapter continues (with the support of some cases) the discussion about general problems of the research into psychopathology, the restrictions of epidemiological research, the importance of a social-his-

torical approach, and the meaning of the distinguishing (and then the integration) of the systemic, developmental and evolutionary perspectives. Wherever possible, suggestions are given for improvement.

The chapter examines biological psychiatry and argues that scientists have to be well aware of the levels of organisation of the systems they investigate. In this framework it is argued that interdisciplinary should be formed. Further, the chapter discusses some aspects of epidemiological research in connection with psychopathology, and the importance of the historical perspective in that context. It is stated that the (clinical) epidemiology can deliver only a limited contribution to the search for (causal) mechanisms. Epidemiology tends to orient itself toward the mapping of associations that come to the surface—even when carefully executed. However, using comparative and historical studies the relativity and ambiguity of clusters of symptoms or disease categories can be demonstrated, and that is of great use.

In many places in this study it is explicated as to why we should ensure that research is done into the origin and course of psychopathology for three—interrelated—reasons: (1) the search for mechanisms: what is the actual operation of an individual system and which role does development and evolution play therein?; (2) the search for developmental trajectories: how does an individual system develop and which role has evolution had therein, and how does the actual operation play a part?; (3) the search for evolutionary backgrounds: how do biosystems of a certain kind evolve, and which role have development and actual operation played therein? General indications resulting from the explications are, among others, the reason why a systemic approach has preference (and that therefore the connection with the physical, social and cultural environment also has to be reviewed), and no levels, links, phases, dimensions or perspectives are allowed to be skipped. Reduction is admissible when no essential information becomes lost and so long as the researcher is well aware of the meaning of emergence and levels, but it must be followed up by synthesis and integration of components of knowledge to reflect the complex reality.

One of the missions of this chapter is to explicate the importance of research into developmental trajectories. In the first place

this importance is shown—almost self-evidently—during the research into disorders that can be identified as developmental disorders. However, examined closely this importance applies to all forms of psychopathology, especially when a chronic course occurs. That which is valid for research into the operation of a system, in which a form of psychopathology has occurred where we are not allowed to skip levels and links, is also valid for research into the development of a form of psychopathology where we are not allowed to skip a single phase. Expressed in a negative way this means that we must become fixated to the (provisional) end states or results of a developmental process; without examination of the preceding developmental process the characteristics of those conditions remain misunderstood.

In this study it is noted many times that it is wrong to fixate attention to the description of symptoms. However, especially when this is the common practice, this does not rule out that the research has a well thought out theoretical framework: without hypotheses there is no data. Without well thought out systems of hypotheses it is extremely difficult to know which behaviour manifestations can or should be understood as a symptom of disease, and which phenomena can function as a sign thereof. Every research begins at the surface; however you need hypotheses to generate the data. The problem is that—certainly in the beginning—the hypotheses do not represent much, and are one-sided, reductionistic, superficial, and poorly oriented to the context. In the beginning of every research this is inevitable. Nevertheless, we can avoid too ‘superficial’ research by striving to work from a metatheoretical framework that fulfils the following two essential heuristic roles: (1) it states requirements to hypotheses, and (2) it states requirements to research. In chapter 9—where it concerns the study of developmental trajectories—the ideas of Karmiloff-Smith about developmental disorders are taken as a starting point. In that context it is argued that all mental disorders with a chronic course have to be investigated as a developmental disorder; the negligence of the developmental dimension predicts that data which are only related to the actual characteristics of humans with a chronic mental disorder add little to the search for the determinants and mechanisms of psychopathology.

The chapter closes with the discussion of the third evolutionary dynamic that is indispensable for the investigation of biosystems. For the assessment of the argumentations in evolutionary psychological and psychiatric considerations it is of great importance to know what the biophilosophical basic assumptions from which the hypotheses and theories have been developed are. For that reason evolutionary and developmental biology (including the work of West-Eberhard about the role of phenotypical plasticity in evolutionary processes) are examined once again. There is also a discussion about some neuroscientific insights of Striedter on the evolution of the human brain. Based on the features of evolutionary processes it is stated, following Darwin and later evolutionists, that no selection for psychopathology can have taken place. It is closed with an estimation of the role that the evolutionary point of view has (or can have in the future) for the study of the determinants and mechanisms of psychopathology.

Chapter 10 contains a number of concluding remarks. Different concepts in relation to the study of biosystems, some of which are of great importance for the conceptualising of and the research into psychopathology, are already discussed in chapter 4. This chapter contains some closing remarks about those concepts. The three dynamical perspectives are examined once again; they are discussed in relation to self-organisation, robustness and fragility, and in connection with the research into determinants and mechanisms of psychopathology. This discussion will be continued in the supplement. There is also a discussion, on the basis of the work of Lewontin, about how the theory of evolution can be applied to mental health and mental disorders.

After a discussion of the importance of the development of models for the research into psychopathology, the chapter examines diagnostics and treatment. There is a clarification on the practical benefit of this study, and in that respect the heuristic role of the attention to functions and dysfunctions, function-oriented diagnostics, research in clinical practice and the consequences of the (function-oriented) view for the treatment of patients with mental problems, is discussed. Further, the chapter discusses the rise of medicine based on evidence. It is examined how this movement relates to the importance of the search for the mechanistic expla-

nations called for in this study. Comments are given about the RCT as the 'gold standard' for decision making for treatment guidelines (instead of knowledge based on mechanistic explanations). Finally, a distinction has been made between medicine on the basis of reflexes versus medicine that is focused on reflection.

For the further development of psychiatry there is a need for a well thought-through conceptual system. In the vision developed in this study, the works of Bunge can form one of the pillars for that. Such a conceptual system can be seen as a compact, in precise-as-possible formulated terms, system of propositions about the ontology of psychopathology and the epistemological and methodological consequences that relate to it. In this chapter the importance of such a – as yet non-existent – system has been stressed, and therefore some requirements are formulated concerning its content.

Finally, on the basis of the central questions of this study, an evaluation of the results of this study takes place and some summarising conclusions are derived. It is stressed that psychiatry needs philosophy if this discipline is to progress further. It is concluded that in this framework the work of Mario Bunge presents an important contribution to both the conceptualising of psychopathology as well as to the philosophy of research into and diagnostics of psychopathology. And lastly, some consequences and implications of the view on research and diagnostics that are developed in this study are highlighted: the importance of the systematic approach for scientific research, the importance of function-oriented diagnostics *and* the importance of the approach of chronic mental disorders as developmental disorders.