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Methodological Issues in Psychiatric Classification

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Against the background of impressive advances in the neurosciences, which are opening new perspectives on the mechanisms of mind, and the development of increasingly powerful instruments and methods with a potential to revolutionise clinical research in psychiatry, clinicians continue to disagree on the definition and taxonomy of the elementary units of observation in their universe of discourse: the individual mental disorders.

Until recently, the state of psychiatric classification could still be characterised by D. H. Tuke's caustic observation made nearly a century ago: "The wit of man has rarely been more exercised than in the attempt to classify the morbid mental phenomena covered by the term insanity. The result has been disappointing. . ." (Tuke, 1892). Thirty years ago this statement was echoed in E. Stengel's authoritative review of the classifications of mental disorders which was undertaken on the request of the World Health Organization:

> "The lack of a common classification of mental disorders has defeated attempts at comparing psychiatric observations and the results of treatments undertaken in various countries or even in various centres in the same country. . . . One of the fundamental difficulties in devising a classification of mental disorders is the lack of agreement among psychiatrists regarding the concepts upon which it should be based: diagnoses can rarely be verified objectively and the same or similar conditions are described under a confusing variety of names. This situation militates against the ready exchange of ideas and experiences and hampers progress" (Stengel, 1959).

Since the time of this report, several significant developments have signalled the beginnings of a new chapter in the science of psychiatric classification:

(a) The WHO 'Programme A' (1965–1972) which resulted in the 8th revision of the mental disorders section of the International Classification of Diseases (ICD) and in the first internationally adopted glossary of mental disorders.

(b) Collaborative international research with important implications for diagnosis and classification, including the USA/UK Diagnostic Project (Cooper *et al*, 1972); the International Pilot Study of Schizophrenia (WHO, 1973, 1979); and the WHO Study on Determinants of Severe Mental Disorders (Sartorius *et al*, 1986; Jablensky *et al*, 1988).

(c) The formulation of explicit ('operational') criteria for diagnosis, beginning with the so-called St Louis or Feighner's criteria (Feighner *et al*, 1972), and followed by the Research Diagnostic Criteria (RDC – Spitzer *et al*, 1978), and then by the *Third Revision of the Diagnostic and Statistical Manual of the American Psychiatric Association – DSM–III*, 1980). This development became one of the most widely debated topics in contemporary psychiatry, occasionally generating claims that "the burden of proof is now on the clinician to show that advances in technology have not made the clinician superfluous in the task of diagnostic assessment" (Spitzer, 1983).

(d) The joint programme undertaken by WHO and the Alcohol, Drug Abuse and Mental Health Administration (ADAMHA) of the USA in which over 160 experts from some 40 countries have been collaborating since 1981, to review the current status of diagnosis and classification in the mental health field and develop a new generation of research instruments for international collaborative studies (Jablensky *et al*, 1983).

However, neither the existing systems of 'operational' diagnostic criteria, nor the results of recent epidemiological, biological and clinical studies, have yet provided a firm basis for resolving the long-standing difficulties besetting psychiatric diagnosis and classification. A good part of these difficulties is of an epistemological nature, and, with the prospect of the tenth revision of ICD becoming adopted in the early 1990s, it is opportune to map out the main issues involved.

Classification as a fundamental cognitive activity

To quote a leading thinker in the science of classification, "even before the advent of man, classificatory ability must have been a component of fitness in biological evolution" (Sokal, 1974). Experimental evidence from developmental psychology suggests that the recognition of similarities and the ordering of objects into sets on the basis of their relationships is a primordial classificatory

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activity which underlies concept formation and the secondary process of naming (Nelson, 1973). The "cutting up of the environment into classification by which non-identical stimuli can be treated as equivalent" (Rosch, 1976) is a cognitive activity present at every level ranging from the socialisation of the child, through coping in everyday life, and all the way to the development of a scientific theory. In the light of cognitive science, the general purpose of classification can be described under three headings:

(a) Economy of memory (or 'reduction of the cognitive load').
(b) Ease of manipulation of objects (by describing and simplifying the relationships among them).
(c) Generation of hypotheses.

The analysis of classification as a cognitive activity requires certain distinctions to be made between key concepts and terms employed in its description.

The term *classification* denotes "the activity of ordering or arrangement of objects into groups or sets on the basis of their relationships" (Sokal, 1974); in other words, it is the process of creation of categories. The product of the process is the *classificatory system*. The act of assigning a particular object to one of the categories is *identification* (in medical practice this amounts to *diagnostic identification*). The term *taxonomy* refers to the study of the various strategies of classification. In the medical domain, *nosology* denotes the system of concepts and theories that support the strategy of classifying symptoms, signs, syndromes and diseases. Finally, *nosography* refers to the act of assigning names to diseases and morbid conditions; the names jointly constitute the *nomenclature* within a particular field of medicine.

According to Feinstein (1972), medical classification must perform three principal functions:

(a) denomination, i.e. assigning a common name to a group of phenomena;
(b) qualification, i.e. enriching the informativeness of the name or category by adding relevant descriptive features such as typical symptoms, age at onset, severity, etc.;
(c) prediction, i.e. a probabilistic statement about the expected course and outcome of the named entity, as well as a statement about its likely response to treatment.

The oldest taxonomic strategy, guided by the Aristotelian notion of 'essence', sets as its ideal the creation of a 'natural' classification. This strategy is based on the belief in the existence of "real-world correlational structures" (Rosch, 1976), and sees the objective of classification in the detection of such structures in a manner that would "carve nature at the joints".

This essentialist position has given a theoretical basis to all grand systems of classification in the natural sciences, including the Linnaean systematics of living organisms and the Darwinian evolutionary system. Although the views on the nature of the constituents of the deepest 'correlational structure' vary and change, this approach has always been characterised by the search for a primary *essence* which, once discovered, should serve as the organising principle. In the instance of Darwins' system, the essence is provided by the species concept; the corresponding taxonomic strategy is therefore described as *phyletic*.

A quite different view has evolved more recently, proceeding from difficulties in applying the Darwinian phyletic principle to the systematics of primitive organisms such as bacteria and viruses. The new approach proposes, as an alternative to the search for 'essences', empirical observation and counting leading to the statistical definition of groups on the basis of the maximum number of shared characteristics. This approach, known as *numerical taxonomy*, became practically feasible only with the advent of computers capable of handling large databases and multivariate techniques such as factor and cluster analysis, discriminant functions, canonical relationships, log-linear models, etc. In a manner reminiscent of the position of logical positivism, numerical taxonomy would like to be free of assumptions and therefore treats, at the start of analysis, all characters and attributes as being of equal weight. As this strategy places a special emphasis on the meticulous description of the *appearance* of objects, it has been called *phenetic*.

Whatever the strategy, the end products of the process of developing a classification, i.e. the actual classificatory systems, fall into two major types.

The first type is the *monothetic* classification in which the taxa or classes differ from one another by the value assigned to a single variable, or a very small number of variables, which provide the organising principle of the system. A pure example of a monothetic type of classification is the periodic table of the chemical elements where atomic weight and valence are the only characteristics that are both necessary and sufficient for the ordering of the entire chemical universe.

The second type is the *polythetic* classification in which the members of a class "share a large proportion of their properties but do not necessarily agree in the presence of any one property" (Sokal, 1974).

Although certain affinities might be found between the phyletic strategy and the monothetic classificatory

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system, and between the phenetic strategy and the polythetic system, such a relationship is not a necessary one. An essentialist philosophy may result in a polythetic system (if the presumed primary essence cannot be represented by a single variable), and a numerical taxonomy is compatible with a monothetic system (if it transpires that the set of shared properties contains redundancy which can be eliminated).

Another important distinction in the taxonomic field is that between *empirical* and *inferential* approaches in the construction of classifications. The empirical approach is strictly limited to observable facts, e.g. the classification of tumours is based solely on their histology. The inferential approach goes beyond the immediately observable and makes inferences or guesses about possible underlying causes and processes, e.g. the distinction between 'endogenous' and 'reactive' depressive illnesses.

The above distinctions provide a three-way *classification of classifications* which can be applied to an examination of issues involved in medical classifications:

1. According to the taxonomic strategy:
   (a) phyletic (essentialist)
   (b) phenetic (numerical taxonomy)
2. According to the type of cognitive operation involved:
   (a) empirical
   (b) inferential
3. According to the end product:
   (a) monothetic
   (b) polythetic

Critical issues in medical classifications

It is customary to describe the progression of medical taxonomy as a sequence beginning with classifications based on the most prominent observable manifestations (e.g. fevers, dropsies, convulsions), followed by classifications with a reference basis in morphology (inflammation, degeneration, neoplasm), and succeeded by classifications based on aetiology (bacterial, viral, parasitic diseases, and so on). Actually, the sequence is less clear-cut, and the development of medical classifications may not be adequately represented by the idea of a logical, linear progression. New scientific paradigms, as well as dominant beliefs and social values, shape medical taxonomies in equal measure. Feinstein (1972) points to three independent groups of factors which influence strongly the present-day taxonomy of diseases:

(a) research technologies which detect new entities requiring classification (e.g. the empty sella syndrome; the fragile X-chromosome syndrome; transmissible dementia);
(b) the trend towards an expansion of out-patient and community care programmes, which result in the discovery of unsuspected abnormalities in clinically healthy people and raise the question about the real location of the boundaries of disease;
(c) the vastly increased computing capacity of medical research which can generate multiple alternative ways of classifying existing empirical data without necessarily depending on new evidence.

The result of these diverse pressures and forces is an explicitly *eclectic* state of classification in the sense that a variety of taxonomic strategies and types of classification can be found to co-exist without a clear predominance of any one approach or principle. While entire major fields of medical disorders are organised polythetically (in fact, almost any of the 'speciality' classifications, e.g. in cardiology, neurology, gastroenterology or dermatology, is polythetic), monothetic types of classification exist within circumscribed areas where a simple organising principle has been discovered or invented (the classification of communicable diseases according to classes of causative agents, disregarding everything else as irrelevant, is an example).

In spite of the apparent logical inconsistency of medical classification (resulting from patchy but still advancing knowledge), classificatory concepts in medicine show an amazing vitality, owing to the availability and consistent application of a single pragmatic criterion: their usefulness in therapeutic and preventive decision-making and in clinical prediction. More effectively than in other branches of knowledge, the everyday application of this criterion in clinical medicine ensures a constant natural selection of concepts by weeding out impracticable or obsolete ideas and ensuring the survival of the fittest.

Several important trends characterise current developments in medical taxonomy in general; they provide an environment that exerts a strong pressure on psychiatric classification:

(a) a predominance of the empirical over the inferential approach (for example, the new computerised imaging techniques extend the clinician's perception into empirical data domains which formerly were only accessible through inference);
(b) emphasis on the reproducibility of observation and of diagnostic decisions, which has led to the formalisation of diagnostic algorithms (the first system of operational diagnostic criteria was the Standardized Nomenclature of Pathology, or SNOP, adopted by cardiologists in 1923);

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(c) development of multicomponent diagnostic systems, including numerical scores or indexes, supplementing the core clinical diagnosis with management-oriented information on the staging of the disease process, its severity, level of impairment, etc.;
(d) use of multivariate statistical methods ranging from factor analysis to Bayesian conditional probability models in the testing of clinical hypotheses;
(e) application of new advances in computer science to develop 'bedside' diagnostic expert systems, based on artificial intelligence concepts and methods.

Current problems of psychiatric classification

In the last decades, the classification of mental disorders has increasingly been the subject of critique from a position of 'social epistemology', which subsumes the labelling theory, the theory of deviance, and the various shades of radical 'anti-psychiatry'. Athough a partial truth can be discerned in each one of these cognate points of view, the problems of psychiatric classification must be placed in the general context of medical classification to be properly understood.

After an early phase of naturalistic description, in which observable symptoms were equated with disease species (Pinel, 1803), psychiatry entered a period of highly speculative theorising which polarised into the opposing doctrines of teleological or 'faculty' psychology (Heinroth, 1818), on the one hand, and the reduction of the phenomena of mental illness to brain pathology (Meynert, 1884), on the other hand. However, neither descriptive empiricism nor the inferential aetiological approach of the nineteenth century provided a foundation for the development of a viable nosology of mental disorders until Griesinger (1861) placed the syndrome and its evolution over time at the basis of psychiatric classification. The further development of the concept of the psychopathological syndrome as the basic unit of analysis, exemplified by the successive versions of Kraepelin's nosological scheme (Kraepelin, 1896), and the fact that it has survived its competitors, confirmed the superiority of the clinical method in psychiatric classification over both the psychological and the organic approaches. In the absence of sufficient basic knowledge, the clinical approach has proved better able to take into account the heterogeneous nature of the conditions that are at present brought together under the single cover of the 'classification of mental disorders' simply because their most conspicuous manifestations are in the realm of subjective experience, social behaviour and cognitive functioning.

It is worth noting that, since the beginnings of scientific psychiatry to the present day, every successful classificatory system, i.e. a system that has generated innovative research or found useful practical applications, has been *eclectic*, while every classification that has attempted to base the ordering of the phenomena of mental illness on a presumed single 'primary essence' has failed in those respects. It has not proved particularly productive to construct classifications proceeding exclusively from aetiology, genetic patterns, or from any other single characteristic, be it age at onset, course and outcome, or treatment response.

The very diverse conditions that are the object of psychiatric classification fall at present into four major clinical classes. These classes are not mutually exclusive and stand closer to statistical clusters than to monothetic taxa.

Organic mental disorders

In this group of conditions there is a demonstrable association between a characteristic cognitive, emotional and behavioural syndrome, on one hand, and a structural or functional lesion of the central nervous system, on the other hand, which satisfies the Koch-Henle postulates (Evans, 1978) for a causal relationship. Classification within this group of neurobehavioural disorders, which include the dementias, dysmnestic syndromes, and deliria, as well as a less well-defined range of schizophreniform and affective illnesses and personality disorders arising on an organic basis, is essentially similar to that in other medical fields. Alcohol- and drug-related mental disorders also belong here, although for practical or administrative reasons they may be identified as a special subgroup. Many of the disorders in this cluster mark the borderline between psychiatry and neurology, or between psychiatry and general medicine. Memory, intelligence, judgement and consciousness are the areas of functioning most frequently affected but it is not certain that the presence of cognitive deficit is a necessary condition for membership of this group. The principal research objectives as regards improvement of diagnosis and classification in this domain concern the refinement of the criteria for early identification, the search for missing links between aetiological factors and clinical manifestations, as well as the delineation of new syndromes and entities. The list of the organic disorders is open-ended, and recent additions such as kuru and AIDS-related dementia illustrate the point.

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Developmental disorders

These disorders have in common an origin in ontogenesis, i.e. in the pre- and post-natal critical periods of growth, maturation, and increased vulnerability of the brain (which probably extend until the fifth or sixth year of life). Disorders falling into this category represent deviations in the pattern or rate of development of normal cognitive functions of skills, due to demonstrable or hypothesised lesions that may be fully reversible, partially reversible, or irreversible. This newly delineated area includes the specific disorders of speech, language, motor function, etc., as well as more complex or 'pervasive' disorders such as autism. Mental retardation also has its place in this group. Research priorities, from the point of view of diagnosis and classification, include the attainment of agreement on descriptive definitions and diagnostic criteria, as a prerequisite to much needed further investigations into causative and pathoplastic factors.

Hypothetical disease entities sui generis, manifesting the syndromes of schizophrenia and related 'schizotypal' disorders, paranoid illnesses, mood (affective) disorders, and acute transient psychotic conditions

This large, clinically and socially significant group, has proved to be singularly refractory to the research strategies that have brought about major advances in other fields of medicine. For decades, the predominant mode of conceptualising the disorders belonging to this group, has been in terms of the disease entity concept. It is hypothesised that the 'primary essence' of each one of these disorders involves a specific cause (or multiple causes), not reducible to the gross or circumscribed lesions underlying the organic mental disorders, and a mechanism of symptom production that is 'endogenous' in the sense of stemming from some fundamental aspects of personality. However, this does not have to remain so, and current advances in the understanding of the neurobiology of behaviour and subjective experience may ultimately result in quite unexpected ways of conceptualising the whole area. This sector of psychiatric classification has been the battleground of most diverse and contrasting views, ranging from the modern 'spectrum' version of the concept of a unitary psychosis (Kety, 1980) to a complete fragmentation of the field into several dozen separate entities, with claims for each having a specific genetic basis, pathogenesis and prognosis (Leonhard, 1957). The overriding need in this area is to delineate diagnostic categories of practical usefulness and heuristic value for research. There is, however, little new knowledge to meet this demand, in spite of the increasingly wide application of almost every innovation in biobehavioural research technology. As in Kraepelin's time, the principal criteria of the validity of diagnostic concepts today remain heritability and prognosis, with the addition of therapeutic response (mainly in the affective disorders) and certain epidemiological characteristics, such as age- and sex-specific expectancy.

Non-psychotic disorders, personality deviations and behavioural abnormalities

This is a mixed bag of conditions that range from extremes of statistical normal variation of traits to possibly specific disorders which may eventually be transferred to other categories. Classification is least satisfactory in this area and it has been said that these disorders "have still to attract their Kraepelin" (Shepherd, 1985). A mix of classificatory strategies (by symptoms, by precipitating factors, etc.) seems to be the currently unavoidable response to the heterogeneous nature of the conditions falling into this ill-defined group.

Implications for the International Classification of Diseases

If the above considerations approximate the real state of affairs even remotely, it must be recognised that a practically useful and scientifically heuristic classification of the mental disorders cannot at present be based on a single principle or criterion. Psychiatric classification cannot be monothetic; it must remain eclectic, without the latter necessarily being a pejorative qualification. Sufficient knowledge to allow a judgement to be made as to whether any 'primary essences' underlie the observable manifestations of mental disorders is simply not available, and the issue should not be pre-judged in the absence of firmly established data and theories. A polythetic approach to classification, taking into account the largest possible number of shared characteristics between phenomenologically identifiable disorders and between groups of individuals with such disorders, would provide a better ground for further research and for practical work with patients than any ambitious scheme based on a single criterion. The strategy that is likely to be the most productive one, considering the present state of psychiatry, is *clinical research* which combines: (a) the study of the phenomenology and longitudinal aspects of series of individual cases of mental disorders; (b) the search for theoretically meaningful correlation between such

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data and the results of independent biological, epidemiological and psychosocial investigations; and (c) the development of *refutable* predictive hypotheses about the 'natural history' of disorders, their response to alternative treatment and management modalities, and their frequency and distribution in defined population groups.

An internationally adopted classification could play a critical role in such research, serving as a tool of communication that should reduce cognitive load, decrease 'noise' and bring about 'ease of manipulation' of diagnoses, treatments, and scientific observations. A good classification should always be designed for a clearly stated purpose and be capable of:

(a) dividing the universe of observations into heuristically useful units leading to action (the latter could be research, treatment, management or planning of services);
(b) generating new observations and questions;
(c) increasing the reproducibility (reliability) of diagnostic identification;
(d) satisfying the cognitive needs of users (i.e., being in accord with their 'world maps', avoiding alien jargon, and being easy to learn and internalise);
(e) being adaptable to, and meaningful in, the largest possible number of different cultural settings;
(f) being translatable (or at least discussable) in terms of other current or past classifications.

These principles have been kept in mind during the processes of consultation and development that have led to the present drafts of ICD-10 Chapter V (F) that are discussed and illustrated in the accompanying papers.

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