Is the concept of "dimension" applicable to psychiatric objects?

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Much has been written about the application of the concept of "dimension" to psychiatry. For example, it constituted one of the early desiderata for the construction of DSM-5, and as late as in 2006 great interest was being expressed in the "dimensional aspects of psychiatric diagnosis" and their "clinical and scientific feasibility" (1). Although this enthusiasm seems to have somewhat waned, confusion remains in various quarters as to the relevance of the concept of dimension to the psychiatric disciplines.

WHAT ARE DIMENSIONS?

There are at least three meanings to "dimension". The central and original one concerns the act of measuring ("a mode of linear measurement in a particular direction") and the magnitudes thereby obtained. By derivation, features of objects susceptible to measurement started to be called dimensions ("the three dimensions of a triangle, a multidimensional space"). Lastly, and by analogical usage, any components of any object or situation became their "dimensions" ("his acting added a new dimension to the play") (2). The act of "measuring" remains the definitory and operational meaning of "dimension". Since "dimensions" have been imported into psychiatry with the explicit purpose of making it more scientific (3), it has to be concluded that it is this central meaning and not the derivative and metaphorical usages that scientific psychiatrists are after.

OF WHAT OBJECTS CAN DIMENSIONS BE JUDICIOUSLY PREDICATED?

The world is populated by all manner of objects, some of which become, in the fullness of time, "epistemic things", that is, objects of science (4,5). In general, objects may exist in space, time, and combinations thereof. Much debate exists as to what constitutes an object. For the practical purposes of this article, object can be defined as "a thing or being of which one thinks or has cognition, as correlative to the thinking or knowing subject; something external, or regarded as external, to the mind" (2).

Objects thus defined have been classified into physical or natural (dogs, houses, rivers, clouds, murmurs, brains, atoms, etc.) and abstract or ideal (virtues, intentions, thoughts, beauty, gods, numbers, etc.). Natural objects do exist in space and time and this attribute makes them targets of measurement. Dogs, tables or flowers are sufficiently stable in the space-time frame to be subject to dimensionalizing, that is, for measuring their spatial features with a standard yardstick and calling them "dimensions" (6). Conversely, abstract objects seem elusive to this type of manipulation (7,8). Indeed, many will feel that they are not susceptible to dimensionalizing at all. When confronted with a keen scientist developing a scale to "measure", say, the four cardinal virtues (temperance, prudence, courage and justice), most sensible people would agree that the concept of "measure" is being used in a metaphorical way, and that what the scientist is doing is undertaking a subjective form of "grading" and using numbers in a nonarithmetic way as labels for the levels of his scale.

Dogs, tables and virtues are not the only objects inhabiting the world. There are also complaints, moans, pains, afflictions, and mental symptoms; some of these are relevant to psychiatry. What sorts of objects are they? Some believe that the objects of psychiatry are like dogs or tables, that is, physical objects (some call them natural kinds) (9). Others may believe that they are ideal objects, like virtues or hopes. So far no *experimentum crucis* has been conceived that might "scientifically" help us to decide. In other words, the reasons for choosing whether psychiatric objects are natural or abstract are not scientific; hence, they are likely to be economic, social, ethical, or aesthetic.

In this article, we put forward the view that, in addition to natural and abstract objects, there are hybrid things in the world with shared features from both, and psychiatric objects are one of the best examples of that type. In principle, all mental symptoms are combinations of physical and ideal attributes; in practice, it is likely that the proportion of each will vary from symptom to symptom. Given that the meaning of all mental symptoms depends on their hybrid nature, reducing mental symptoms to either their physical (brain correlates) or ideal component (meaning) would impede understanding (10,11).

CAN PSYCHIATRIC (HYBRID) OBJECTS BE DIMENSIONALIZED?

Whether or not the concept of dimension applies to an object depends on its ontological structure, that is, the way in which it is made and framed in space and time. Because hybrid objects are *sui generis* in this regard, it is the duty of psychiatrists to determine whether they can be dimensionalized at all. As far as we know, such a task

has not yet been undertaken and yet the concept of dimension has been happily imported into psychiatry.

Why this haste is an important question. One explanation may be that such importation is encouraged by the (rife) belief that mental symptoms are physical objects (natural kinds) and hence that measuring their brain correlates is tantamount to measuring the symptoms in their totality (12). Another explanation may be that, under the influence of the old psychometry, it is believed that (even if they are hybrid objects) mental symptoms can be measured (captured) by "good quality" psychometry followed by sophisticated statistical analysis that might be able to convert numeric labels of intervals into real arithmetic "dimensions" (13). Whatever the explanation, we argue that the hybrid structure of mental symptoms needs to be fully understood before trying to dimensionalize them.

It has been claimed above that mental symptoms (e.g., hallucinations, delusions, obsessions, depressive mood) are hybrid objects, and that in each case the proportional contribution of physical and semantic attributes is likely to vary. To this, we could add that it is also likely that such proportions are liable to change for each symptom as it moves from the acute to the chronic state (i.e., hallucinations and delusions in the earlier episodes of psychosis may be structurally different from the "same" phenomena during the chronic stages) (14).

In practice, this would mean that the application of the same type of psychometric instrument to all mental symptoms, or to the same symptom during the early and chronic states of the disorder, may be unhelpful. This is because the reliability and validity of a scale depend on the stability in time and space of the object it purports to measure. In this sense, scales rely on the fact that the measurable "dimensions" or "components" of the object in question maintain their magnitude and combinatorial proportionality. If these were to change, then the scale would be useless at the second time round.

It must also be stated that, against renewed hopes that stable brain correlates will soon be discovered for each mental symptom, this has not happened so far and most (if not all) of the diagnostic scales in use obtain their information from verbal accounts given by patients, relatives and observers (15). By definition, this information is not susceptible to dimensionalizing. While there is nothing wrong with using subjective information to gain an idea of mental symptoms' severity or change, it would be wrong to call the number labels that we attach to levels of a scale dimensionalizing. The correct name for this act is grading.

THE CONCEPT OF GRADING

In the case of natural objects, dimensions are brought into being by the very act of measuring their spatial attributes. In the case of abstract objects, "dimensions" are used metaphorically as such objects are not framed in space. Indeed, abstract objects are but constructs, bundles of qualities brought together within a given narrative (e.g., temperance, prudence, courage or justice). For example, moral narratives help to organize and categorize the actions of men and decide who possesses "more" of a particular virtue. To achieve these comparisons, throughout history, forms of evaluation have been developed to decide, for example, whether a given action is "unjust, partially just or just". How is this grading undertaken? On what is the subcategorization of its intervals based? Are its foundations stable enough to stand intrapersonal or transpersonal comparability? (16).

In this regard, the first point to make is that grading is carried out by means of categories that are external and reside not in the object itself (i.e., they are not internal to it) but in the eye of the evaluator. We have seen above that abstract objects (like virtues) are bundles of qualities brought together under a name. Grading consists in stretching each of these qualities along a score range marked by grading labels in which typically the higher scores are not mathematical multiples of the lower ones. Hence, they cannot really be considered as dimensions but only as grades.

Differentiating grading from measuring is essential. They are different mental operations and belong to different realms of knowledge. Grading is a form of evaluation and hence it accepts predicates such as fair, just, regular, consistent, benevolent, and so forth. Adjectives such as exact, reliable, valid, sensitive, specific, true, and the like cannot apply to it. Grading is always in the eye of the beholder, and the fact that some evaluators may be consistent in their evaluations (i.e., in attaching the same grading label to the same value or proportion) does not make grading into a form of measurement. Psychiatrists may want to use numbers as grading labels, but what they cannot do is perform mathematical operations on them. The point here is not simply one of semantics or misnomering. Believing that mental symptoms and disorders can be truly dimensionalized (i.e., measured) carries the erroneous implication that psychiatric objects are natural kinds. This implication has had (and has) as a consequence the undertaking of expensive and unproductive empirical research, and prevents the development of more useful approaches to psychiatry and its objects.

We argue that, in the current knowledge, psychiatric scales are no more than grading labels, and that the "dimensions" they purport to "measure" are no more than qualities stretched out along arbitrary ranges.

Given that: a) mental symptoms are hybrid objects, that is, composites of physical and abstract attributes, b) each mental symptom has a different structure when compared with another mental symptom and when compared with itself in the life history of a patient, and c) the physical components of mental symptoms are mostly unknown, it can be concluded that all we have

left to do is grade (evaluate) the subjective complaint as carried or communicated by the patient or the relative or as based on clinical observation. Evaluations are not related to measurement or dimensions; they are graded labels applied to the varied densities in which qualities may present themselves.

CONCLUSIONS

Dimensioning is a form of measurement that can only be applied to attributes of objects existing in space or time, that is, natural objects. Abstract objects can be evaluated, not measured. Hybrid objects (like mental symptoms) possess attributes from both types of objects and ideally they should be susceptible to measurement and evaluation. In practice, this is not the case, as the structure and components of mental symptoms remain mostly unknown. Little of substance is known about their natural properties, and, at any rate, their definition in most cases depends on their meaning, that is, the symbolic position they occupy in a given intersubjective context.

This implies that mental symptoms can only be evaluated (not measured). Evaluations are forms of grading by means of which qualities are stretched out and given grading labels capturing subqualities such as intensity, severity, duration, persistence, and so forth. As they are, grading labels can, in fact, be useful in the description and management of mental symptoms. However, they are not quantifiable. Neither the number-labels attached to them can be treated as real quantities nor can the evaluated qualities be called "dimensions". The same constraints apply to "mental disorders". The fact that throughout history mental symptoms have been made to cluster up in particular ways does not make the resulting clusters less qualitative. Like the mental symptoms that constitute them, mental disorders can only be graded or evaluated.

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