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REVIEW ARTICLE

The feasibility and need for dimensional psychiatric diagnoses

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ABSTRACT

Background. It is our contention that both categorical and dimensional approaches to diagnosis are important for clinical work and research alike, and that each approach has its drawbacks and advantages. As the processes toward developing DSM-V and ICD-11 progress, we suggest that another exclusively categorical revision of psychiatric taxonomies will no longer be sufficient and that adding a dimensional component is a necessary step if these taxonomies are to continue serving the future clinical and research needs of psychiatry as they have so effectively done in the past.

Method. We begin the paper with a review of terminology related to categories and dimensions and briefly review literature on advantages and disadvantages of both approaches.

Results. A review of relevant literature supports both the need for and feasibility of augmenting traditional categorical diagnoses with dimensional information.

Conclusion. We conclude with a proposal for preserving traditional categorical diagnostic definitions, but adding a dimensional component that would be reflective of and directly referable back to the categorical definitions. We also offer a specific proposal for adding a dimensional component to official taxonomies such as the DSM and the ICD in a way that fully preserves the traditional categorical approach.

INTRODUCTION

It has long been traditional in psychiatry to focus on categorical diagnoses. As the processes toward development of DSM-V and ICD-11 get under way, one focus of discussion concerns the long-known advantages and disadvantages of adding a dimensional option to complement the categorical definitions of psychiatric diagnoses. Depending on the outcome of these deliberations, a consideration of dimensional approaches could represent little or no change, or a sea change in the structure of official taxonomies. Accordingly, the relevance of this decision both to clinical diagnosis and to the use of diagnosis in research settings deserves careful consideration. In this paper, we present some of the issues involved, briefly review relevant literature, and propose a framework for gradually incorporating a dimensional component into the process of psychiatric diagnosis while still preserving the traditional diagnostic categories.

We begin with a brief discussion of terminology. A clear distinction should be made between 'disorder' and 'diagnosis'. 'Disorder' refers to the clinical condition of a patient, 'diagnosis' to the label used to represent information about that clinical condition. The reliability, validity, sensitivity and specificity of a diagnosis all relate to the correspondence between the diagnosis and the disorder itself. The issue in this paper is diagnosis, not disorder; psychiatry has as yet no 'gold standard' for identifying disorders. However, the quality of a

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diagnosis is important because it represents the means by which we communicate and gain understanding of the etiology, course, treatment and prognosis of a disorder.

The DSM-IV (APA, 1994) and ICD-10 research criteria (WHO, 1992) are examples of categorical diagnostic systems. For each disorder, they list a series of criteria and rules regarding number and patterns of criteria needed for a diagnosis. A patient either meets or fails to meet the relevant criteria for specific diagnoses and a yes/no (categorical) diagnostic decision is rendered accordingly.

By contrast, a dimensional system acknowledges that there may be clinically important individual differences among those who fall above, and among those who fall below, a categorical diagnostic threshold. These differences may be represented on any scale ranging from a three-point ordinal measure to a continuum satisfying stringent normal distribution assumptions. Such differences between individuals might include elements such as the number or pattern of positive symptoms, the severity of symptoms, or co-morbidity. Thus rather than rendering only a single, dichotomous judgment regarding the presence or absence of a diagnosis, individual patients are rated on a quantitative dimension. Examples of dimensional approaches commonly used in contemporary psychiatry are the Hamilton Scale for Depression (Hamilton, 1960), the Positive and Negative Syndrome Scale (PANSS) for schizophrenia (Kay *et al.* 1987) and the seven-point Clinical Global Impressions Scale (Guy *et al.* 1970). As reviewed below, both categorical and dimensional approaches to diagnostic classification have advantages and disadvantages, but both are useful in describing disorders.

There are two other key terms used later in this paper. 'Top-down' and 'bottom-up' denote two processes by which diagnostic criteria are derived. Top-down is the historical standard for psychiatry. Experts deliberate, consult, review their clinical experience, survey existing literature, and in some cases perform secondary data analyses of existing data to ultimately decide upon the criteria. A bottom-up approach is driven more directly by exploratory data analysis. One typical method is to begin with a large pool of possibly relevant signs and symptoms that are then ascertained from large, representative populations to develop scores or classes. Such development may be based on complex statistical models (e.g. Latent Class Models, Item-Response Theory) or on judgments of reliability and coherence. Bottom-up approaches tend to be more objective than top-down, but are also dependent on the reference population(s) in which the measures are developed and the statistical assumptions made by those doing the analyses. Different researchers using bottom-up approaches even on the same set of data may come to different conclusions. Consequently, with either a bottom-up or a top-down approach, the proposed diagnosis must be evaluated for clinical validity using external criteria. A widely used example of a bottom-up dimensional classification system is the Childhood Behavior Checklist (CBCL; Achenbach, 1991).

As discussed in the following literature review, the relative advantages of categorical and dimensional approaches to classifying psychopathology have been a matter of debate for many years (Kessler, 2002; Pickles & Angold, 2003). Recent literature tends to acknowledge that both approaches have their merits, and that both may be necessary for a comprehensive taxonomy (Goldberg, 2000; Haslam, 2003). Thus, while a major revision to diagnosis could be considered disruptive, there have been many calls for a dimensional approach in psychiatric diagnosis and some novel ideas for how this might be accomplished (Krueger *et al.* 2005*b*). One possible resolution is to include both categorical and dimensional criteria within the same diagnostic system. For DSM and ICD, this could be done by defining a set of categorical diagnostic criteria using the same top-down process as used previously. Dimensional criteria that correspond to those categorical definitions could then be created using quantitative methods. After a brief review of relevant literature, we offer a specific proposal for adding a dimensional component to psychiatric diagnosis, and then propose a method for achieving this goal.

REVIEW OF THE LITERATURE

Categories and dimensions: advantages

Kendell & Jablensky (2003) note that carefully defined categorical diagnostic criteria have resulted in significant improvements in at least

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four domains of psychiatry: (1) diagnostic agreement (reliability) and communication; (2) more precise criteria, and instruments based on them, which have now become the norm in research; (3) teaching based on an international reference providing a worldwide common language; and (4) public access to diagnostic definitions, thus improving communication with patients.

Clinicians routinely need to make categorical decisions based on the available clinical data. Kraemer *et al*. (2004) note the regular need for categorical decisions in medicine such as whether to treat, type of treatment, whether to hospitalize, etc. 'The problem is not whether to use a categorical approach, but rather which categorical approach to use' (Kraemer *et al*. 2004).

However, dimensional approaches are equally important for other crucial goals in both clinical and research arenas. As Goldberg (2000) notes, categorical criteria are important for determining which patients are sufficiently ill to justify treatment, but dimensions are much better suited to understanding relationships between social and biological variables. van Os *et al*. (1996) point out that practicing clinicians are accustomed to adopting a dimensional perspective – severity of illness, for example – in clinical practice in order to develop a treatment plan and assess clinical progress. In assessing whether a particular treatment is benefiting an individual patient, the clinician tends to use dimensional information, not merely whether the patient still meets diagnostic criteria but whether some improvement has been seen.

There are several potential benefits of a dimensional expansion of categorical diagnoses. The most immediate is that it provides for a diagnosis-specific quantitative score, when desired, using a consistent methodology across studies or individual patients. Similar quantification is already widely used; the Hamilton scales for depression (Hamilton, 1960) and anxiety (Hamilton, 1959) or the Alcohol Use Disorders Identification Test (AUDIT; Babor *et al*. 2001) are prominent examples. However, there are many such scales available, sometimes even multiple versions of the same scale, and considerable inconsistency in the choice of scale(s) across studies. A uniform, officially sanctioned approach would promote consistency and improve cross-study comparability. This would benefit both investigators and clinicians. Clinical providers often need to estimate and communicate at a quantitative level – illness severity, for example – in addition to having a categorical diagnosis, but there is little communicative value if the quantitative scale is not uniform and consistent.

A second advantage of creating dimensional scales that relate to the categorical diagnoses is that even a basic level of quantification increases statistical power without diminishing the utility of the categorical definitions. Strictly categorical diagnoses ignore phenotypic differences among those who do, and among those who do not, meet the diagnostic threshold. As the power of statistical tests depends on recognition of such individual differences, many more subjects are always needed to achieve the same power with a categorical diagnosis than with a corresponding dimensional one. The statistical power available for hypothesis testing is always reduced when restricted to categorical data (Cohen, 1983). In fact, conflicting conclusions may be drawn from the same data depending on where the categorical diagnostic cut-point is set (Kraemer *et al*. 2004).

Commitment to dimensional elaboration for all psychiatric diagnoses could also offer new perspectives about the perplexing taxonomic problem of co-morbidity, the simultaneous occurrence of putatively distinct disorders (Maser & Patterson, 2002). When a single patient meets criteria for more than one diagnosis, current conventions dictate we apply both diagnostic labels. However, categorically defined groupings of psychopathology frequently overlap. In fact it has been repeatedly shown in both clinical and population samples that syndromal overlap is more the rule than the exception (Kendell, 1975).

A dimensional alternative could replace the awkwardness of categorical co-morbidity with a simple severity score for each syndrome, whether that syndrome rises to the level of categorical diagnosis or not. This permits creating patient-specific diagnostic profiles across illnesses and helps to ensure that treatment efforts address the full range of current psychopathology (Helzer & Hudziak, 2002). Research efforts also benefit from empirical quantification of patient diversity, particularly

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when that diversity extends to symptoms in multiple diagnostic domains. It is that diversity, cutting across our diagnostic conventions, that is so inadequately captured within a purely categorical system (Krueger, 2002).

Dimensional equivalents are also potentially advantageous for a better understanding of public health and epidemiological data. Many concerns have been expressed about large differences in diagnostic rates in the major epidemiological studies that have been carried out in the USA and elsewhere over the past 25 years. As Regier *et al.* (1998) point out: 'relatively small changes in diagnostic criteria and methods of ascertainment have produced substantially different results'. The reliance on categorical definitions, with caseness defined by a single threshold, compounds the problem. Helzer *et al.* (1985) have demonstrated that identified cases in the general population tend to aggregate at the diagnostic threshold. Thus, a single symptom endorsement in one direction or the other often determines a subject's diagnostic status. Diagnostic reliability tends to fall to that of the least reliable symptom. A uniform inventory of criteria items would permit comparison of illness rates using nominal, categorical diagnoses to distribution scores of ordinal data. Knowing the distributions of such ordinal data would provide for cross-population comparisons that are considerably more nuanced than is the case with purely categorical approaches.

Categories and dimensions: disadvantages

Dimensional and categorical approaches each have their disadvantages as well. Perhaps the greatest disadvantage of a dimensional system is an increased complexity in clinical communication. In a categorical system, the tendency is to think in terms of a single diagnosis. Even when a patient meets criteria for more than one diagnosis, we generally attempt to identify a primary or principal diagnosis. Dimensional approaches strive to rate severity both within and across areas of psychopathology. Rather than a single diagnosis, the conceptual structure is of a profile of scores representing the level of pathology in several illness domains. While this increases the amount of relevant clinical information conveyed by the diagnosis, it obviously does not lend itself to such simple communication. Psychologists accustomed to such dimensional clinical tools as the CBCL (Achenbach, 1991) and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher *et al.* 1989) are probably more comfortable than physicians trained to think in terms of specific diagnoses and treatment algorithms based on them. While many psychiatric clinicians might find it difficult to conceptualize a series of dimensional scores, this may be changing. Physicians in other specialties are increasingly using combinations of dimensions, such as symptom severity, symptom counts and laboratory values to guide treatment algorithms. An example is the Framingham Risk Assessment Tool for predicting the likelihood of, and intervention strategies for, coronary heart disease based on several dimensional variables including blood pressure, cholesterol level, age and smoking status (Wilson *et al.* 1998).

Perhaps the greatest disadvantage of a categorical system is the limitations, both clinical and statistical, imposed by the forfeit of clinical information inherent in labeling patients based solely on whether their signs and symptoms collectively rise above a defined threshold. To take an extreme example, if the diagnostic criteria require a duration of at least 28 days, the patient whose illness manifestations lasted 27 days is considered equivalent to someone who has never had that illness, but completely different from someone whose duration was 29 days. In turn, the latter patient is considered equivalent to someone who has experienced the signs and symptoms for years. In clinical application, this often translates into treating patients with minimal need, or denying treatment to patients who clearly need it. This may be particularly problematic cross-culturally, that is applying categorical criteria developed in one culture to other cultures where relevant categorical thresholds may differ.

In recent years, there has been a growing acknowledgment that whichever diagnostic criteria are satisfied, and to what degree, may moderate the effect of treatments (Kraemer *et al.* 2002, 2005). When this is so, clinicians must have access to that additional information to optimize treatment. In research applications, categorical diagnosis translates into a loss of power to detect effects, and thus to a requirement for much larger sample sizes to detect

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statistically significant effects. Even when there is statistical significance, the effect size is attenuated, thus creating the appearance of a lack of clinical significance.

A PROPOSAL FOR ADDING A DIMENSIONAL COMPONENT TO PSYCHIATRIC DIAGNOSIS

Initially it may seem perilous to propose two sets of diagnostic criteria, for example to retain categorical definitions but add dimensional ones. The principal value of official taxonomies has been to provide uniform illness definitions. Even though these definitions may not answer all the needs of all users, they do provide specificity and consistency. A parallel, dimensional approach might be seen as perturbing this basic function.

This is an important concern, but we feel it is possible to add dimensional definitions without giving up uniform categorical illness definitions. First, the use of the dimensional option would be at the discretion of the user. Second, the presence of this option would not affect the typical use of psychiatric categorical diagnoses as the sagreed, uniform set of definitions. Third, our proposal not only preserves categorical definitions but also does not alter the process by which these definitions would be developed. Those charged with developing criteria for specific mental disorders would operate just as their predecessors have.

It could be argued that if a dimensional equivalent were optional it simply would not be used. However, the rapid, nearly universal popularity of DSM-III in the early 1980s suggests otherwise. While there may have been an implied mandate to use the DSM-III categorical definitions in the USA, there was no such implication internationally. The almost immediate worldwide popularity of DSM-III, especially among investigators, was based on its utility and the recognition that uniform, explicit illness definitions in psychiatry was an idea whose time had come. We argue that a similar change in paradigm to a more empirically based approach to illness definition is now due and would be similarly welcomed. Investigators value dimensions as a means of refining phenotypic definitions and increasing statistical power. Clinicians rely on dimensional scales such as the Hamilton or Beck depression scales to improve quantification of clinical illness. Incorporation of dimensional criteria into official nomenclatures in a way that can be related back to the categorical definition could serve the same unifying function in current taxonomies as consistent categorical definitions did in DSM-III. To encourage use, it would also be important to include the dimensional component in the body of the criteria rather than as an appendix. The latter would constitute a weak endorsement that probably would indeed condemn the dimensional equivalents to disuse and obscurity.

A dimensional component

Although not advisable, a simple way of obtaining diagnostic-specific dimensional scores is by adding the number of positive symptoms from the categorical definition. The scores for each diagnosis can be summed to obtain a global severity score reflecting an estimate of total psychiatric pathology. However, simply adding the number of positive symptoms uses few of the potential advantages of a dimensional component.

A more powerful option would be to add an element of dimensionality to the component signs and symptoms within each categorical definition. This could be done uniformly across all diagnoses or separately for each diagnosis. Each choice has its advantages and drawbacks. A uniform approach could be accomplished by ranking each criterion item on a three-point scale, for example, where: 0 = not present; 1 = sometimes present; 2 = severe or often present.

There is evidence that many patients are uncomfortable responding dichotomously, that is answering symptom items with a 'yes' or 'no' in absolute terms (T. M. Achenbach, personal communication). A dimensional option for individual symptoms could reduce error that may result from forcing patients into categorical decisions about symptom items that are not necessarily experienced categorically. Thus, offering an intermediate response may reduce patient response burden while simultaneously creating a database that is more valid and conveys more clinical information. Scaling each item also increases the potential for identifying more homogeneous subgroups of patients. If

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categorical symptom data are preferable for any reason, investigators can merge the 1 code with 0 or with 2 to create dichotomous items.

The above suggestions have the advantages of being simple and utilitarian (Achenbach *et al.* 1991) as well as uniform across diagnoses. However, a simple, cross-diagnostic scale potentially mixes frequency, severity and impairment; furthermore, it may not apply equally well to all diagnoses. Another option is for dimensional scoring of criteria to vary across diagnoses. For example, if a particular laboratory test is discovered to be a strong indicator of some diagnosis, the test result might be included in its natural units (e.g. cortisol level or hippocampal volume). Eventually there may be biological markers identified for different disorders. That alone suggests the importance of establishing the precedent now for inclusion of a dimensional component that would eventually facilitate the inclusion of such biological markers into future psychiatric diagnoses. While significant advantages might accrue if symptom coding were identical across diagnostic groups, the various psychiatric diagnoses are certainly not equivalent in terms of number of criteria, how criteria are structured, duration and other features, nor is it likely in the future that the same biological markers will be important for different disorders. Conversely, there are also disadvantages of allowing the dimensional symptom scoring to vary by diagnosis. It is far more complex and some elements, such as biological variables, may not be available in developing countries because of lack of resources.

In principal, dimensional coding of each criterion item, however it is done, offers significant advantages, and takes on added importance given the possibility that genetic transmission of psychopathology may operate at the level of individual symptoms rather than diagnostic or syndromal levels (van Praag, 1990). The particular coding scheme requires additional discussion and is beyond the scope of this paper.

However it is achieved, it is important that the dimensional set relates directly to the corresponding categorical definition. At the initial stage of adding a dimensional component to psychiatric diagnosis, it could be argued that the best way to proceed is to create dimensional alternatives that are simply a quantitative elaboration of the items included in the final categorical definitions. For example, Logistic Regression Analysis could be used with the categorical diagnosis as the dependent variable, and the corresponding dimensional descriptions to develop a dimensional risk score, similar to the development of the Framingham index for cardiovascular disease (Truett *et al.* 1967). An alternative would be to use Recursive Partitioning methods, again with the categorical diagnosis as the dependent variable. Such approaches would provide a direct, dimensional reflection of the categorical definition that could be used for genetic and other analyses to increase statistical power.

A SPECIFIC PROPOSAL FOR MOVING FORWARD

This paper outlines an ambitious agenda for incorporating a dimensional component into established psychiatric taxonomies. We contend that such an agenda is vital to our continued growth both as a medical specialty and as a science. This step may seem audacious to some, but with new research knowledge, in large part made possible by the explicit categorical definitions contained in DSM-III and DSM-IV, and increasing needs for improved phenotype definitions for future genetics and other research, many would consider it an abrogation of responsibility if we fail to move our taxonomic system in a more dimensional direction. However, it is vital that this transition be accomplished in a way that is minimally disruptive. An understandable tension is created each time a major taxonomy is revised; any revision to something as basic as our diagnostic vocabulary has drawbacks, but it is also necessary that the taxonomy progress so as to reflect scientific advance. In order to judge the potential risks and benefits of including a dimensional component in DSM-V and ICD-11, it is necessary to consider how to accomplish this transition in a way that minimizes disruption. We suggest that the following proposal enables a needed change, but in an orderly and evolutionary, not revolutionary, manner.

Transitional details

In their recent iterations, both the DSM and the ICD have utilized panels of experts to survey

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current knowledge, consult with various experts, and use their own clinical expertise to create the categorical diagnostic definitions. We recommend these diagnostic 'workgroups' again be constituted for the next iterations of the DSM and ICD. However, we also propose that for both DSM and ICD, a *dimensions* workgroup be appointed at the same time and work interactively with the *diagnostic* workgroups. The principal role of the dimensions workgroup would be to articulate general principles related to a dimensional component and to help each diagnostic workgroup make the best possible choices consistent with those principles in the course of designing a dimensional component. A dimensions workgroup should be composed, in part, of a few clinicians and statisticians who are familiar with and interested in the dimensional issues raised here. In order to be well integrated, we would also envision that a dimensions workgroup would include one interested member from each of the diagnostic workgroups.

There are a number of specific tasks that could be included in a broad agenda for a dimensions workgroup. A few examples are listed here. For simplicity, we have made the examples referable to the DSM, but they are equally relevant to the ICD.

- In previous versions of the DSM, the diagnostic workgroups have used secondary analyses of existing datasets to guide diagnostic revision. A corresponding effort for a dimensions workgroup could be to review existing literature for comparative studies of categorical and dimensional approaches. This would be informative as to the optimal design for a DSM-V dimensional component. For example, the universe of sophisticated quantitative techniques for linking data to conceptual models of psychopathology is ever expanding, and now includes a number of novel developments directly relevant to integrating and comparing categorical and dimensional accounts of psychopathology, such as means of directly comparing latent dimensional and latent class models (Krueger *et al.* 2005*a*; Muthen, 2006) and taxometric techniques (Waller & Meehl, 1998). Another important review topic would be the Spectrum Project, an international collaborative effort to develop a dimensional approach to mood and anxiety diagnoses, and associated efforts (Maser & Patterson, 2002; Cassano *et al.* 2004; Frank *et al.* 2005). Indeed, international collaboration should be encouraged because data from different nations and cultures can be pooled, thereby allowing for an empirical perspective on the adequacy of various taxonomic models in various locations around the world (see e.g. Krueger *et al.* 2003).
- A second important agenda item is how inclusive the creation of dimensional options should be. There are nearly 300 defined categorical diagnoses in DSM-IV and likely to be at least that many created in DSM-V. Should a dimensional option be created for each categorical diagnosis or only for selected ones? Some areas may even be ready for a more fundamental restructuring of the existing categories in favor of an alternative dimensional model. For example, the conceptual and empirical limitations of the existing Axis II personality disorder categories are well known, such that discussions leading up to DSM-V have centered on the possibility of replacing the existing categories with an alternative dimensional model (Widiger *et al.* 2005). Might some dimensions be added to DSM-V that cut across putatively distinct categories of psychopathology? Examples include internalizing and externalizing dimensions that appear to underlie many common forms of psychopathology in both children (T. M. Achenbach, personal communication) and adults (Krueger, 2002; Kendler *et al.* 2003; Krueger & Markon, 2006).
- The diagnostic and dimensional workgroups would collaborate in creating dimensional scoring for the criterion items as each diagnostic workgroup creates the categorical definitions for the diagnoses within its scope of work. As discussed above, this is an important element in the model we propose for creating a dimensional component.
- There is an ongoing debate about the appropriateness of using impairment as part of diagnostic definitions or as a basis for determining caseness in survey research (Regier & Narrow, 2002; Wakefield & Spitzer, 2002). A dimensions workgroup could explore this issue further and oversee testing of various

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definitions of impairment at the symptom, syndrome and diagnostic level to further explore appropriateness.

- The elaboration of categorical diagnoses with dimensional methods is commonly used in other branches of medicine such as primary care, oncology and elsewhere to stage levels of illness, guide treatment recommendations and improve outcome predictions (Wasson *et al.* 1985). One task of a dimensions workgroup could be to consult with leaders in these other areas to learn more about their methods.
- Consistency in the collection of clinical and epidemiological data would be enhanced if structured interviews and/or questionnaires were developed and offered as part of the DSM-V. Patient self-administered questionnaires could be developed to gather relevant symptom data. Such efforts would offer even greater benefit if users had the choice of paper or computer administration. There is considerable evidence that responses to computerized interviews are more candid than face-to-face responses (Lucas *et al.* 1977; Perlis *et al.* 2004). If necessary, adaptive testing technologies could be used, as appropriate, to minimize the response burden of structured assessments (Simms & Clark, 2005). Such assessment tools may or may not compete with existing interviews such as the Structured Clinical Interview for DSM-IV-TR (SCID) or the Composite International Diagnostic Interview (CIDI). Unlike current tools, the instruments we envision would focus on dimensional as well as categorical assessment and would of course be based on a new set of criteria, namely DSM-V.

CONCLUSIONS

While adding a dimensional component to psychiatric diagnoses as we propose represents a departure from tradition, it is an idea that has been circulating for decades and we feel the time to implement this has now come. The value of a medical taxonomy is twofold: (1) a convention for classification and communication, and (2) a scientific tool to better understand the nature of illness. A top-down, categorical system has and continues to function reasonably well for the first of these, but as a tool for better understanding the nature of psychiatric illness, there is little left to learn from another iteration of a strictly categorical psychiatric diagnosis. There is growing recognition of the problems inherent in a purely categorical classification, problems that will only be exacerbated as we begin to incorporate biological information (genes, imaging, neurochemical levels) into the diagnosis along with other signs and symptoms. However, as we contemplate adding a dimensional component to psychiatric diagnosis to better position ourselves to address future needs, it is vital that we also preserve a solid bridge to the categorical taxonomy. The prior needs for a set of explicit categorical diagnoses will not become any less important.

Much has been done to devise and test more quantitative, dimensional taxonomies for psychopathology (Horn & Wanberg, 1969; Wanberg *et al.* 1977; Tarter *et al.* 1992). However, findings are difficult to compare across studies due to differences in overall approach, research goals and study design. With regard to dimensional approaches, the field seems to be at the point we were in terms of categorical definitions of illness in the late 1970s, prior to the introduction of DSM-III; that is, a growing recognition that a common, explicit taxonomic language is essential to progress. As the ongoing need for revision has demonstrated, DSM-III was not a perfect set of categorical diagnoses, but it did provide a consistent set of definitions so that previously widely divergent research efforts could begin to form a more cohesive body of work. Among other advantages, this permitted subsequent revisions of the DSM taxonomy to be increasingly guided by objective evidence. The proposal we offer for supplementing categorical criteria in DSM-V and ICD-11 with a dimensional component, also explicitly defined and used consistently, could help us realize a new set of advantages such as greater statistical power, improved predictive validity, more focused treatments, and new opportunities for genetic and other etiological research.

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DECLARATION OF INTEREST

None.

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