Prototype diagnosis of psychiatric syndromes

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The method of diagnosing patients used since the early 1980s in psychiatry, which involves evaluating each of several hundred symptoms for their presence or absence and then applying idiosyncratic rules for combining them for each of several hundred disorders, has led to great advances in research over the last 30 years. However, its problems have become increasingly apparent, particularly for clinical practice. An alternative approach, designed to maximize clinical utility, is prototype matching. Instead of counting symptoms of a disorder and determining whether they cross an arbitrary cutoff, the task of the diagnostician is to gauge the extent to which a patient's clinical presentation matches a paragraph-length description of the disorder using a simple 5-point scale, from 1 ("little or no match") to 5 ("very good match"). The result is both a dimensional diagnosis that captures the extent to which the patient "has" the disorder and a categorical diagnosis, with ratings of 4 and 5 corresponding to presence of the disorder and a rating of 3 indicating "subthreshold" or "clinically significant features". The disorders and criteria woven into the prototypes can be identified empirically, so that the prototypes are both scientifically grounded and clinically useful. Prototype diagnosis has a number of advantages: it better captures the way humans naturally classify novel and complex stimuli; is clinically helpful, reliable, and easy to use in everyday practice; facilitates both dimensional and categorical diagnosis and dramatically reduces the number of categories required for classification; allows for clinically richer, empirically derived, and culturally relevant classification; reduces the gap between research criteria and clinical knowledge, by allowing clinicians in training to learn a small set of standardized prototypes and to develop richer mental representations of the disorders over time through clinical experience; and can help resolve the thorny issue of the relation between psychiatric diagnosis and functional impairment.

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Diagnosis includes two components: the way disorders are classified, and the way patients are diagnosed using that classification system. The DSM-III represented a pivotal moment in the evolution of both. First, it shifted from a classification system that had little grounding in empirical research to one that had at least modest grounding and, more importantly, created the conditions for an explosion of research on psychiatric disorders. Second, it shifted from a way of diagnosing patients with little reliability between any two clinicians or researchers to an approach that had high reliability for research purposes (using structured interviews) but continued to have considerable problems in clinical settings (see 1).

In the intervening decades, thousands of studies have focused on classification – e.g., whether adding, subtracting, or revising this or that diagnostic criterion might make some kind of difference in reliability or validity – yet little research has focused on how to make the diagnostic process more clinically useful, valid, and reliable. The assumption of the framers of subsequent editions of the DSM has been that clinicians need to change their ways and start diagnosing patients the way researchers do.

The problems with that assumption are multifold. DSM-IV-TR (2) is an 886-page manual. The idea that clinicians in everyday practice could, would, or should ask questions about each of hundreds of largely irrelevant criteria for hundreds of largely irrelevant disorders when a relatively high-functioning patient presents with, for example, anxiety symptoms and marital problems, is questionable at best. Further, many of the questions required to make a research diagnosis are unrelated to the tasks of clinical diagnosis and treatment. Whether a patient with bulimic symptoms has binged and purged twice a week every week for an arbitrarily specified period of time is far less useful to know clinically than that the patient is binging and purging frequently (e.g., daily, weekly, or multiple times a day) and that binge episodes seem to be preceded by feelings of rejection or abandonment.

The arbitrary nature of criteria for severity, duration, and number of symptoms met is not just a problem for clinical work but for research as well. In meta-analyzing the results of empirically supported therapies for some of the most prevalent disorders (e.g., mood and anxiety disorders), colleagues and I found that the average study excluded the majority of patients even considered for clinical trials because they did not meet rigid inclusion criteria or they had "comorbidities" that are in fact the norm, not the exception, in both research and clinical work (3). Further, clinical trials require categorical diagnoses as a prerequisite for entry into the study, yet virtually none uses them as a primary outcome measure, because a patient can lose just one or two symptoms of the disorder over the course of several weeks and thus appear to have "remitted" when he or she may in fact remain highly symptomatic. Instead, researchers use dimensional measures of constructs such as depression or anxiety as outcome criteria because they recognize that patients vary on *the extent* to which they are symptomatic, not just on whether they are symptomatic.

I could offer a long list of such concerns about the count-and-cutoff approach to diagnosis used in psychiatric diagnosis since 1980, such as the dif-

ficulty both clinicians and researchers have in remembering the criteria and complex diagnostic algorithms for even the most common disorders, and the fact that the modal patient receives a low-information "not otherwise specified"("NOS") diagnosis in nearly every domain of the diagnostic manual, but will not enumerate such a list here (see 4,5). Suffice it to say that it is perhaps no surprise that a method of diagnosing patients designed for research purposes that was never tested empirically in any way against any alternative other than the failed DSM-I/DSM-II approach would itself run into problems over time, particularly as conceptions of psychopathology have changed (e.g., understanding most disorders as spectrum disorders or as present in varying degrees). The framers of ICD-10 attempted to coordinate with their DSM counterparts, but where they wisely parted company was in creating a distinct manual for clinical diagnosis that built in considerably more flexibility and a much more user-friendly format. The problem with diagnostic flexibility, of course, is that different clinicians can exercise that flexibility differently, leading to problems in reliability of diagnosis in clinical practice.

We have developed an alternative, prototype-matching approach to diagnosis, in which diagnosticians compare a patient's overall clinical presentation to a set of diagnostic prototypes – for clinical use, paragraph-length descriptions of empirically identified disorders – and rate the "goodness of fit" or extent of match of the patient's clinical presentation to the prototype. Rather than inquiring about each of several hundred symptoms, assessing whether the patient "has" each symptom, and then adding or otherwise combining symptoms (e.g., 3 from column A, 5 from column B) to determine whether the patient crosses a diagnostic threshold for "caseness", the clinician uses all available data – including clinical observation, patients' answers to questions, chart data, data from informants or past treatments, and the narratives the patient offers about his or her problems and relationships – to determine *the extent to which* the patient matches diagnostic descriptions that weave together diagnostic criteria into a memorable *gestalt* designed to facilitate pattern recognition.

In our prototype-matching procedure for clinical diagnosis (4,7), the diagnostician rates the patient on a 5-point scale for degree of match to the prototype (Figure 1). The scale ranges from 1 (*little or no match*) to 5 (*very good match – patient exemplifies this disorder; prototypical case*), with ratings of 4 and 5 corresponding to categorical diagnosis and a rating of 3 indicating *subthreshold* or *clinically significant features* of the disorder (much as physicians measure blood pressure treated as a continuous variable but by convention refer to values in certain ranges as "borderline" or "high"). Thus, a single rating yields both a dimensional and a categorical diagnosis without relying on symptom counting. The default value for each diagnosis is 1 (*little or no match*), so that clinicians only expend time rating prototypes of disorders relevant to the patient, allowing rapid diagnosis. The easy translation of dimensional into categorical diagnosis (e.g., a 3 translating to *clinically significant features*) is of particular use for communication among professionals, who are unlikely to find it useful to describe a patient as "3 on major depression, 2

Patients who match this prototype have experienced or witnessed a traumatic event that elicited intense feelings of fear, helplessness, or horror. They persistently re-experience the event, which may haunt them in numerous forms: they may have intrusive thoughts, mental images, or dreams related to the trauma; they may feel as if they are reliving the event, through flashbacks, illusions, hallucinatory images, or a sense that the event is occurring again; or they may experience intense psychological distress or physiological arousal when "triggered" by cues that resemble or symbolize the event. Patients who match this prototype try to avoid stimuli, thoughts, feelings, places, people, or conversations that might remind them of the event, and are often unable to recall important aspects of it. They may also "shut down", experiencing an emotional numbing that leaves them with a restricted range of emotion, a sense of a foreshortened future (e.g., not expecting to have a career, marriage, children, or normal lifespan), feelings of detachment or estrangement from others, or diminished interest or participation in significant activities that once excited them. Patients who match this prototype have persistent symptoms of physiological arousal, such as difficulty falling or staying asleep, difficulty concentrating, exaggerated startle response, hypersensitivity to possible signs of danger, irritability or outbursts of anger.

1	little or no match (description does not apply)	
2	some match (patient has ***some features*** of this disorder)	
3	moderate match (patient has ***significant features*** of this disorder)	**Features**
4	good match (patient ***has*** this disorder; diagnosis applies)	**Diagnosis**
5	very good match (patient ***exemplifies*** this disorder; prototypical case)	

Figure 1 Post-traumatic stress disorder prototype