

## SCIENCE BRIEFS

# Causal Theories of Mental Disorder Concepts

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According to recent studies, an estimated one-quarter of Americans suffer from a clinical mental disorder in any given year, and nearly half of these are diagnosed with two or more disorders (Kessler, Chiu, Demler, & Walters, 2005). While some may see in these alarming statistics a crisis in American mental health, others may believe that the same statistics call into question the validity or reality of our taxonomy of mental disorders. For example, the number of mental disorders listed in the *DSM* grew from about 60 in the first version (APA, 1952) to over 400 today (APA, 2000; see also Houts, 2002). The *DSM-IV-TR* (APA, 2000), the current version, lists caffeine induced sleep disorder and caffeine intoxication as mental disorders. Observations such as these have helped to fuel an influx of recent popular-press books with such titles as “*They Say You’re Crazy: How*

*the World’s Most Powerful Psychiatrists Decide Who’s Normal*,” “*Making us Crazy: DSM: The Psychiatric Bible and the Creation of Mental Disorders*,” and “*The Selling of DSM: The Rhetoric of Science in Psychiatry*.” In the midst of all this, one might wonder what experienced clinicians themselves think of the *DSM* taxonomy. Do experts, at least, believe that *DSM* mental disorders should be treated as real, natural kinds? Ahn, Flanagan, Marsh, and Sanislow (2006) found, to the contrary, that clinicians – just like undergraduate students – were quite reluctant to endorse *DSM* mental disorders as naturally existing concepts, that is, categories that are to be discovered in the world.

In discussing how clinicians may perceive (or question) the validity of the *DSM* mental disorders, it may be helpful to consider how the current *DSM* system came to be

developed. By the 1970’s, the *DSM* task force had launched a concerted effort to base the next version of the manual on research as opposed to consensus (Malik & Beutler, 2002), but most mental disorders at that time still lacked a single universally acknowledged pathogenesis. In response to this problem, the modern editions of the *DSM* (i.e., *DSM-III*, 1980; *DSM-III-R*, 1988; *DSM-IV*, 1994) adopted “a descriptive approach that attempted to be neutral with respect to theories of etiology” (APA, 1994; pp. xvii-xviii). In accord with this approach, most disorders are currently defined in terms of a set of surface symptoms or conditions the patient must meet for diagnosis (in addition to functional impairment). For example, schizophrenia is defined as having 2 or more of the following 5 symptoms (along with an impaired level of functioning): hallucinations, delusions, disorganized speech, grossly

disorganized or catatonic behavior, or negative symptoms. If this type of representation format was adopted in other fields of medicine, for example, obstetrics, we might similarly define the early stages of pregnancy as displaying 7 or more of the following 10 symptoms: extreme fatigue, increased sense of smell, weight gain, missed period, weepiness, hunger, nausea and vomiting, heartburn, increased urination, or constipation, in addition to impairment in functioning. Thus, if clinicians follow the prescribed diagnostic approach of the *DSM*, they will search for symptoms in their patients that match the *DSM* diagnostic criteria and make diagnoses accordingly, without incorporating any additional notions they may have of how these symptoms may affect each other and, in many disorders, what caused these symptoms in the first place.

Despite all this, practicing clinicians often tell us (anecdotally) that many psychologists don't actually use the *DSM* the way they are supposed to. Thus, we set out to examine more systematically how clinicians *do* represent their concepts of mental disorders. Our earlier research showed that clinicians' concepts of mental disorders are actually quite theory-based rather than theory-neutral (Kim & Ahn, 2002). We presented practicing clinical psychologists with the *DSM* symptoms (i.e., the diagnostic criteria plus the characteristic features also described in the *DSM*) of a variety of Axis I and Axis II disorders. When asked to specify any relations among the symptoms within a mental disorder, clinicians spontaneously drew fairly complex structures among symptoms (56.6 arrows per disorder per participant across three experiments) for a variety of disorders. Interestingly, 97% of all relations that our participants drew were causal relations or relations that imply causality (Carey, 1985; Wellman, 1990), further suggesting clinicians'

Figure 1

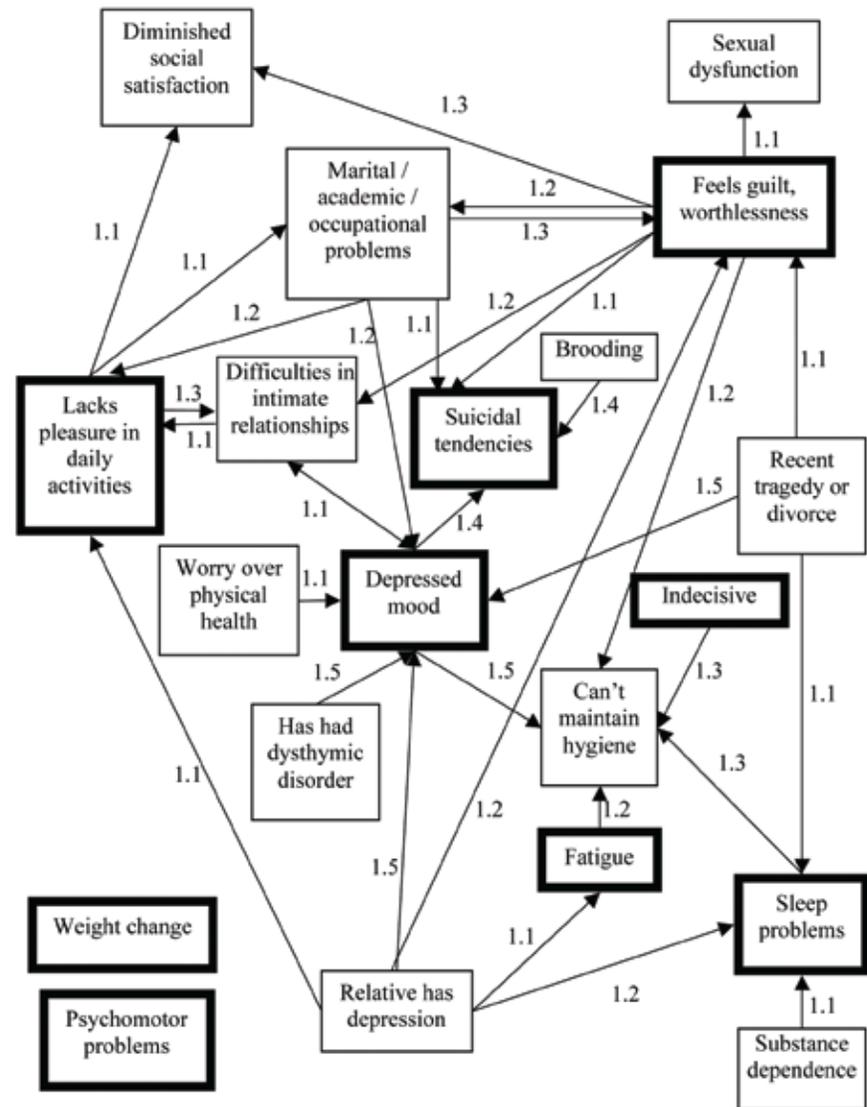


Figure 1. A composite of clinicians' drawings of Major Depression in Kim and Ahn (2002). *DSM-IV-TR* (APA, 2000) diagnostic criteria are shown in boldfaced boxes.

concepts of mental disorders are not merely statistical correlations of symptoms. Figure 1 shows a composite of clinicians' causal theories for major depressive disorder. We also found that for familiar disorders such as depression, anorexia, and borderline personality disorder, clinicians of differing theoretical orientations were significantly in agreement with each other regarding the causal structure of the symptom-to-symptom relations in the disorder<sup>1</sup>. Moreover, we found that

laypeople also agreed with the general structure of clinicians' theories, suggesting that these theories (at a general level) are understandable in commonsense terms.

We further examined whether these theories influence how clinicians differentially weigh symptoms of mental disorders in diagnosis. We hypothesized that symptoms that cause many other symptoms (i.e., causally central) would be treated as

<sup>1</sup> As we picked not only the diagnostic criteria but also the characteristic features described in the *DSM*, some of the features that could serve as causes for symptoms (e.g., biological relatives) were included, but we did not present other deeper causal factors that went beyond the *DSM* characterization (e.g., atypical attachment style, poor resolution of the oral stage).

Figure 2

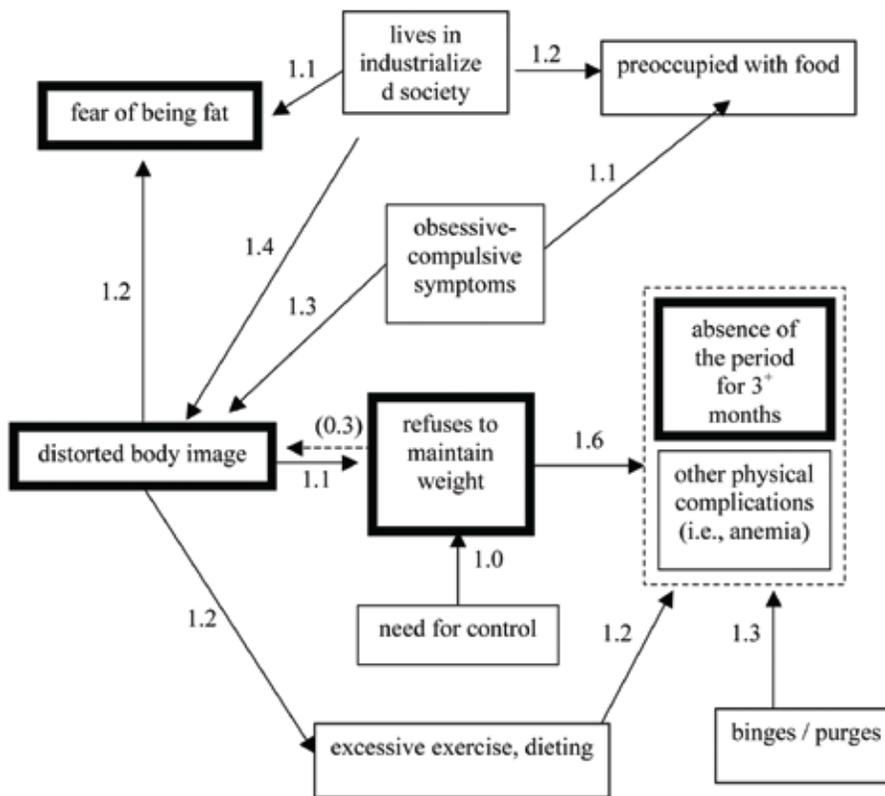


Figure 2. A composite of clinicians' drawings of Anorexia Nervosa in Kim and Ahn (2002). DSM-IV-TR (APA, 2000) diagnostic criteria are shown in boldfaced boxes.

being more important than symptoms that cause few other symptoms (i.e., causally peripheral). The tendency to weigh causes more than effects in classification is rampant in real-life situations. DNA structure causes many other properties of plants and animals, and is therefore considered important to these categories (e.g., if we are told that a plant lacks tulip DNA, it will never be classified as a true tulip, no matter how similar it looks to a tulip). In law, the severity of the crime often depends more on the suspects' intentions rather than their surface behaviors (e.g., killing someone by accident is a much less serious offense than intending to kill someone but inadvertently botching the plan).

In contrast, the system is set up, with a few explicit exceptions, so that all symptoms in a given disorder are equally weighted. For instance, the

four symptoms with boldface boxes in Figure 2 must *all* be present to warrant a diagnosis of Anorexia nervosa, making all four symptoms equally important for classification. However, according to the clinicians' data collected in our experiments, "distorted body image" was most causally central in the clinicians' theories, whereas "absence of the period (in women) for more than 3 menstrual cycles" was rated the most causally peripheral. Furthermore, "distorted body image" was considered to be the most diagnostically important of the criteria, and "absence of the period (in women) for more than 3 menstrual cycles," though also a DSM diagnostic criterion for Anorexia nervosa, was considered to be the least diagnostically important. We obtained similar patterns of results across eight other mental disorders (Kim & Ahn, 2002).

To more closely mimic real-life diagnostic situations, we also developed pairs of descriptions of hypothetical patients. One of the hypothetical patients in each pair consisted of symptoms that were causally central in a participant's theory for a particular disorder, and the other consisted of symptoms that were causally peripheral. For each disorder, we equated the number of DSM-IV-TR diagnostic criteria between the two hypothetical patients in each pair; therefore, if diagnoses were based strictly on the DSM, then the two hypothetical patients should be considered equally likely to be diagnosed with the disorder. Instead, we found that clinicians judged patients with causally central symptoms to be more likely to have a target disorder and to more clearly exemplify the target disorder than patients with causally peripheral symptoms. Furthermore, clinicians' memory for patients' symptoms, measured about an hour later, also showed that causally central symptoms were most likely to be accurately recalled. Finally, when we presented clinicians with causally central and causally peripheral symptoms (according to their own theories) that were *not* present in the hypothetical patients we created, they were more likely to falsely recall the causally central symptoms having been present in those patients.

Causal knowledge also influences clinicians' judgments of patients in a more global sense. Ahn, Novick, and Kim (2003) examined whether causal explanations influence clinicians' overall perception of how normal a person is. Meehl (1973) informally noted that when clinicians felt that they understood a patient, the patient seemed normal; that is, "understanding it makes it normal." We developed descriptions of hypothetical patients with three symptoms that are causally linked (e.g., "Because Penny frequently suffers from insomnia and is in a habitual state of sleep deprivation, she has trouble remembering the names of objects. This memory problem, in

turn, leads her to suffer from episodes of extreme anxiety, because she fears that it will cause her to embarrass herself in front of others"). One group of participants received these descriptions of three causally related symptoms. The other group received additional causal explanations for the root symptom in each of these causal chains. For instance, the phrase, "because she is very stressed out due to her workload," was added as an explanation for why "Penny frequently suffers from insomnia." As predicted by Meehl (1973), clinicians who received the additional life-event root cause explanations judged that these people were more normal than those who did not receive such explanations.

Critics of clinical diagnostic practices have long observed that clinicians tend to rely upon intuitive thinking in making diagnoses and predicting outcomes for individual patients, rather than making statistically based diagnoses (Dawes, 1994; Garb, 1998; Meehl, 1954; Meehl, 1973) or using structured clinical interviews. Intuitive thinking might be illustrated by a clinician who attempts to make a diagnosis by interviewing the patient and trying to understand what the person's problem is, as well as how it came about. Statistically based diagnoses, on the other hand, might be accomplished by administering a test to the patient such as the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943), its revision (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kraemer, 1989), or other statistically-based scales. Dawes, Faust, and Meehl (1989) have argued that such statistical methods of prediction are in fact more accurate and reliable than using the intuitive, clinical method. Similarly, structured clinical interviews such as the SCID and others, which fall somewhere on the spectrum between the intuitive and statistical approaches, have, like the MMPI, been shown to significantly increase the accuracy and reliability of diagnoses compared to a purely intuitive approach (e.g., Ramirez Basco, Bostic, Davies, Rush,

Witte, Hendrickse, & Barnett, 2000; Zanarini & Frankenburg, 2001).

Despite these choices, many clinicians may still find that they prefer those methods incorporating relatively more intuitive and theory-based judgment for the following reasons. First, statistical evidence that does not convey information underlying causal mechanisms may be perceived to be coincidental, or not causal (Ahn, Kalish, Medin, & Gelman, 1995). Indeed, a number of the test items in the original MMPI (Hathaway & McKinley, 1943) lacked face validity, and as a result, items that predicted a particular diagnosis did not necessarily make intuitive sense in terms of that diagnosis (Rogers, 1995). For example, one item assessing whether the respondent believes that Washington was a better president than Lincoln was coded for schizophrenia. Such statistical evidence without intuitive causal understanding may therefore be unlikely to be used by clinicians, especially when the intuitive approach carries more face validity than the purely statistical approach. The revised MMPI (Butcher, Dahlstrom, Graham, Tellegen, & Kraemer, 1989) omits many of these items with low face validity, which may explain, in part, its current widespread use. To give an example from another medical domain, a recent study (Focht, Spicer, & Fairchok, 2002) found that when duct tape was applied over a wart, warts disappeared in 85% of cases. This covariation data is statistically reliable, but one might still be reluctant to put duct tape over a wart because it is difficult to believe that there is a causal relationship if we do not understand the mechanism by which it occurs. If one is told about the mechanism – that this remedy works by irritating the skin, thereby stimulating an immune system response that will eradicate the viral infection that had caused the wart – the covariation data are now more compelling.

A second reason why clinicians are theory-based reasoners is that it may

in fact be rational. Categorization based on theories rather than surface features is considered to be more scientifically fruitful; that is, it provides a framework for explanation, prediction, and general scientific understanding (Hempel, 1965). A recent example in the medical domain clearly illustrates this point. Cancers have been categorized mainly by where they originate in the body: skin, colon, and so on. However, there has been a trend to re-classify cancer based on genetic characteristics as scientists gain more understanding of its inner workings. The reason for this reclassification attempt is improved predictability. Even two tumors from the same part of the body that look the same on a pathologist's slide can differ at the gene and protein level, responding differently to different treatments (van 't Veer, Dai, van de Vijver, He, Hart, Mao, et al., 2002; see also Pollack, 2008). Although diagnoses may be quite accurate when using purely statistical methods, such methods of diagnosis may not help us when it comes to theorizing about what factors contribute to causing the mental disorder.

Finally, do the results of our research say anything at all about how the *DSM* should be revised? Although professional mental health practitioners' reasoning about mental disorders appears to be theory-based, it does not necessarily follow that the *DSM* system should therefore be modified to be deliberately theory-based. To make such a claim might be as absurd as claiming that the periodic table should be modified to fit the way chemists reason about elements. We suggest a much more moderate view. Zachar and Kendler (2007) recently argued that the domain of mental disorders is more like the domain of biology, where the category boundaries are not clear-cut and the taxonomy is not based on category essences. They even assert that we are quite unlikely to ever come up with any etiologically based taxonomy for mental disorders because they are highly complicated and multiply

determined (Zachar & Kendler, 2007). As a result, they argued that at some level, we must consider having a degree of nominalism in our taxonomy of mental disorders. That is, we need to admit that at least some aspects of the DSM mental disorder taxonomy must be *determined* (as opposed to discovered) with practical concerns and goals in mind.

If it is correct to say that we need to consider practical concerns in developing the taxonomy of mental disorders in the upcoming *DSM-V*, it may make sense to at least consider practicing clinicians' theories in revising the *DSM*, as these clinicians are the users of this manual. How clinicians actually use (or don't use) the manual determines how diagnoses will be made. That is, what clinicians have to say about their understanding of mental disorders may actually provide useful information for making pragmatic decisions about the category boundaries or category representations in the *DSM*. In particular, our earlier studies (Kim & Ahn, 2002) suggest that despite the relative paucity of information about etiology in the *DSM*, mental health clinicians are cognitively driven to seek out causal explanations and are influenced by these explanations. Whereas the field may not be ready to decide upon definite deeper etiologies for disorders to be explicitly selected for or excluded from the *DSM*, our research has shown that at the more surface level (e.g., among symptoms or conditions) there is a level of general agreement in clinicians' causal descriptions. Clinicians' reports of causal relations among the symptoms or conditions included in the *DSM-IV* were consistent across theoretical orientations (e.g., psychoanalysis; behavioral modification); furthermore, these relations were commonsensical enough to be consistent with lay people's opinions (e.g., 'not maintaining normal weight' causes 'absence of the period' in anorexia nervosa; 'depressed mood' causes 'suicidal tendencies' in major depression). Thus, instead of sticking with a purely descriptive

approach, incorporating a causalist approach, whenever possible and wherever reasonable, may actually encourage clinicians to rely more on the *DSM*. As we suggested, incorporating causal information at the symptom-to-symptom level might be a reasonable place to start. Attempting to adhere solely to a descriptive approach in the *DSM* may not necessarily lead to better reliability in clinicians' diagnoses. ■

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