# Diagnostic categories or dimension? A question for the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition

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# Diagnostic Categories or Dimensions? A Question for the *Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition*

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The question of whether mental disorders are discrete clinical conditions or arbitrary distinctions along dimensions of functioning is a long-standing issue, but its importance is escalating with the growing recognition of the frustrations and limitations engendered by the categorical model. The authors provide an overview of some of the dilemmas of the categorical model, followed by a discussion of research that addresses whether mental disorders are accurately or optimally classified categorically or dimensionally. The authors' intention is to document the importance of this issue and to suggest that future editions of the *Diagnostic and Statistical Manual of Mental Disorders* give more recognition to dimensional models of classification. They conclude with a dimensional mental disorder classification that they suggest provides a useful model.

*Keywords:* diagnosis, classification, dimensional, categorical, *DSM–V*

It is stated in the American Psychiatric Association's (2000) *Diagnostic and Statistical Manual of Mental Disorders* (text revision; *DSM–IV–TR*) that "there is no assumption that each category of mental disorder is a completely discrete entity with absolute boundaries dividing it from other mental disorders or from no mental disorder" (p. xxxi). Nevertheless, "*DSM–IV* is a categorical classification that divides mental disorders into types based on criterion sets with defining features" (American Psychiatric Association, 2000, p. xxxi). Researchers and clinicians, following this lead, diagnose and conceptualize the conditions presented in *DSM–IV–TR* as disorders that are qualitatively distinct from normal functioning and from one another.

The question of whether mental disorders are discrete clinical conditions or arbitrary distinctions along dimensions of functioning is a long-standing issue (Kendell, 1975), but its importance is escalating with the growing recognition of the limitations of the categorical model (First, 2003; Widiger & Clark, 2000). In 1999, a *DSM–V* Research Planning Conference was held under joint sponsorship of the American Psychiatric Association and the National Institute of Mental Health, the purpose of which was to set research priorities that might affect future classifications. One impetus for this effort is the frustration with the existing nomenclature.

> In the more than 30 years since the introduction of the Feighner criteria by Robins and Guze, which eventually led to *DSM–III*, the goal of validating these syndromes and discovering common etiologies has remained elusive. Despite many proposed candidates, not one laboratory marker has been found to be specific in identifying any of the *DSM*-defined syndromes. Epidemiologic and clinical studies have shown extremely high rates of comorbidities among the disorders, undermining the hypothesis that the syndromes represent distinct etiologies. Furthermore, epidemiologic studies have shown a high degree of short-term diagnostic instability for many disorders. With regard to treatment, lack of treatment specificity is the rule rather than the exception. (Kupfer, First, & Regier, 2002, p. xviii)

*DSM–V* Research Planning Work Groups were formed to develop white papers that would guide research in a direction that would maximize impact on future editions of the diagnostic manual. The Nomenclature Work Group, charged with addressing fundamental assumptions of the diagnostic system, concluded that it will be "important that consideration be given to advantages and disadvantages of basing part or all of *DSM–V* on dimensions rather than categories" (Rounsaville et al., 2002, p. 12). We begin this article with an overview of some of the dilemmas of the categorical model, followed by a discussion of the validity and utility of dimensional and categorical models of classification.

## Dilemmas of the Categorical Model

*DSM–IV* provides diagnostic criterion sets to help guide the clinician in making the correct diagnosis and an additional section devoted to differential diagnosis that indicates "how to differentiate [the] disorder from other disorders that have similar presenting characteristics" (American Psychiatric Association, 2000, p. 10). The intention of this information is to help the clinician determine which particular mental disorder is present, the selection of which would hopefully indicate the presence of a specific pathology and suggest a specific treatment (Frances, First, & Pincus, 1995; Kendell, 1975). It is evident, however, that *DSM–IV* routinely fails in the goal of guiding the clinician to the presence of one specific disorder, despite the best efforts of the leading clinicians and researchers who have authored the manual. Two issues that are endemic to the diagnostic manual are excessive diagnostic co-occurrence and unresolvable boundary disputes.

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## Excessive Diagnostic Co-Occurrence

The term *comorbidity* refers to the co-occurrence of distinct disorders, each presumably with its own etiology, pathology, and treatment implications. "The greatest challenge that the extensive comorbidity data pose to the current nosological system concerns the validity of the diagnostic categories themselves—do these disorders constitute distinct clinical entities?" (Mineka, Watson, & Clark, 1998, p. 380).

Concurrent diagnostic comorbidity is the norm rather than the exception, with the rate dramatically increasing if one considers lifetime comorbidity (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). Quite a few previously published reviews have documented this concern (Krueger & Tackett, 2003; Mineka et al., 1998; Sher & Trull, 1996; Widiger & Clark, 2000). Diagnostic comorbidity is so extensive that some researchers argue for abandoning the term "comorbidity" in favor of a term (e.g., "co-occurrence") that is more simply descriptive and does not imply the presence of distinct clinical entities (Lilienfeld, Waldman, & Israel, 1994). There are instances in which the presence of multiple diagnoses suggest the presence of distinct yet comorbid psychopathologies, but in many cases the co-occurring diagnoses suggest the presence of common, shared pathologies, notably a negative affectivity (neuroticism or emotional instability) dimension common to the mood, anxiety, and most personality disorders, and an externalization (disinhibition) dimension common to antisocial and substance use disorders (Kendler, Prescott, Myers, & Neale, 2003).

> Comorbidity may be trying to show us that many current treatments are not so much treatments for transient 'state' mental disorders of affect and anxiety as they are treatments for core processes, such as negative affectivity, that span normal and abnormal variation as well as undergird multiple mental disorders. (Krueger, 2002, p. 44)

Excessive diagnostic co-occurrence among the personality disorders has been widely replicated (Bornstein, 1998; Lilienfeld et al., 1994; Widiger & Trull, 1998). O'Connor and Dyce (1998) explored whether the covariation among the personality disorders reported in nine previously published studies could be explained adequately by a dimensional model of personality functioning. They conducted independent principal-axes confirmatory factor analyses of 7 alternative dimensional models on 12 correlation matrices provided by the 9 studies, and they obtained highly significant congruence coefficients for all 12 correlation matrices for 2 of the 7 models. "The personality disorder configurations that were most strongly supported. were the two that are based on attempts to identify basic dimensions of personality that exist in both clinical and nonclinical populations" (O'Connor & Dyce, 1998, p. 15). More specifically, "the highest and most consistent levels of fit were obtained for the five-factor model and for Cloninger's (2000) seven-factor model" (O'Connor & Dyce, 1998, p. 14).

Lynam and Widiger (2001) explored further whether the co-occurrence among the personality disorders could be explained from the perspective of the five-factor model (FFM) of general personality functioning. The FFM is a dimensional model that consists of five broad domains (extraversion, agreeableness, conscientiousness, neuroticism, and openness) that can be further differentiated into more specific facets (McCrae & Costa, 1999).

For example, in the influential NEO Personality Inventory—Revised (NEO PI–R; Costa & McCrae, 1992), the domain of agreeableness (vs. antagonism) can be differentiated into six facets of trust and gullibility (vs. skepticism, mistrust), honesty and straightforwardness (vs. deception, manipulation), altruism and sacrifice (vs. egocentrism, exploitation), compliance and submission (vs. oppositionalism, aggression), modesty and self-effacement (vs. conceit, arrogance), and tendermindedness and softheartedness (vs. toughmindedness, callousness). Lynam and Widiger (2001) had personality disorder researchers describe prototypic cases of each *DSM–IV* personality disorder in terms of the 30 facets of the NEO PI–R. They then obtained the correlations among the personality disorders with respect to the similarity of their FFM descriptions, and they found that the diagnostic co-occurrence among them reported in 15 previous studies could be largely accounted for by the covariation among their FFM personality trait profiles. "Under the FFM account, disorders appear comorbid to the extent that they are characterized by the same [FFM] facets" (Lynam & Widiger, 2001, p. 409).

## Boundary Disputes

*DSM–IV* is replete with problematic boundary disputes, many of which could be the result of arbitrary categorical distinctions being imposed along common, underlying domains of functioning. New diagnoses added to the nomenclature or to the appendix of *DSM–IV* reflect not so much the discovery of a previously unrecognized disease, pathogen, or lesion but are instead efforts to fill gaps among existing categories. Notable examples include bipolar II (filling a gap between bipolar I and cyclothymia), mixed anxiety-depressive disorder (mood and anxiety disorders), depressive personality disorder (personality and mood disorders), and postpsychotic depressive disorder of schizophrenia (schizophrenia and major depressive disorder) (Frances et al., 1995). New diagnostic categories are helpful in decreasing clinicians' reliance on the not otherwise specified diagnosis to plug these gaps, but they can also have the effect of creating additional boundary confusions. Notable border disputes include the distinction between oppositional defiant, attention-deficit (with and without hyperactivity–impulsivity), and conduct disorder; anorexia and bulimia; trichotillomania and obsessive–compulsive disorder; depressive personality disorder and dysthymia; conversion and dissociative disorder; acute stress and dissociative disorder; muscle dysmorphic, body dysmorphic, and eating disorders; and body dysmorphic and anxiety disorder (Frances et al., 1995; Phillips, Price, Greenburg, & Rasmussen, 2003). To illustrate, we discuss generalized social phobia, schizoaffective disorder, and mixed anxiety-depressive disorder. These three diagnoses are particularly revealing examples because they are on the borders of domains of psychopathology that, historically, have been regarded as relatively distinct.

*Generalized social phobia.* Social phobia was a new addition to the *DSM–III* (Spitzer, Williams, & Skodol, 1980). It was originally considered to be a distinct, circumscribed condition, consistent with the definition of a phobia: a "persistent, irrational fear of a *specific* [italics added] object, activity, or situation" (American Psychiatric Association, 2000, p. 826). The four most common situations avoided by persons with a social phobia were specified as "speaking or performing in public, using public lavatories,

eating in public, and writing in the presence of others " (American Psychiatric Association, 1980, p. 227). It was even indicated in the *DSM–III* that most persons with a social phobia were usually fearful of just one of these four situations just mentioned.

*DSM–III* excluded the possibility of diagnosing a social phobia if the person met criteria for an avoidant personality disorder (American Psychiatric Association, 1980). This exclusion was consistent with hierarchical rules for addressing overlapping diagnostic categories (First, Spitzer, & Williams, 1990). "A symptomatically more pervasive disorder preempts the diagnosis of a less pervasive disorder that is based on a symptom that is part of the essential features of the more pervasive disorder" (Spitzer & Williams, 1987, p. 431).

After the publication of the *DSM–III*, however, it became apparent to specialists in the treatment of anxiety disorders that the phobic behavior of many of their patients failed to be as circumscribed as required by the *DSM–III*. Therefore, a generalized subtype was constructed for the *DSM–III–R* (Spitzer & Williams, 1985) and the avoidant personality disorder exclusion criterion was deleted (American Psychiatric Association, 1987). It was even indicated in the *DSM–III–R* that social phobias are usually chronic and begin "in late childhood or early adolescence" (American Psychiatric Association, 1987, p. 242). In the *DSM–IV*, it was noted further that "social phobia typically has an onset in the midteens, sometimes emerging out of a childhood history of social inhibition or shyness" (American Psychiatric Association, 1994, p. 414), consistent with the definition of a personality trait. Efforts to distinguish generalized social phobia and avoidant personality disorder have been largely ineffective, indicating at best that avoidant personality disorder tends to be, on average, relatively more dysfunctional than generalized social phobia (Widiger, 2003b). In the current text revision of the *DSM–IV–TR*, it is acknowledged that "they may be alternative conceptualizations of the same or similar conditions" (American Psychiatric Association, 2000, p. 720).

*Schizoaffective disorder.* Schizoaffective disorder might be the prototypic boundary condition. It had the unique distinction in the *DSM–III* (American Psychiatric Association, 1980) of being the only disorder that lacked the specific and explicit criterion set that was the major innovation of the diagnostic manual (Spitzer et al., 1980). A consensus could not be reached on its defining features in large part because it represented the gray area between schizophrenia and mood disorders. It was to be used in the *DSM–III* "for those instances in which the clinician is unable to make a differential diagnosis with any degree of certainty between Affective Disorder and either Schizophreniform Disorder or Schizophrenia" (American Psychiatric Association, 1980, p. 202).

However, clinicians had difficulty identifying and researchers had difficulty studying a condition with no diagnostic criteria. Therefore, specific and explicit diagnostic criteria were developed for the *DSM–III–R* (American Psychiatric Association, 1987). The diagnostic criteria for schizoaffective disorder, however, have been notably complex and problematic (Frances et al., 1995). Proposed revisions included the development of increasingly more narrow definitions, hoping to eventually identify a distinct clinical entity, or, alternatively, the delineation of new diagnoses, such as the "mainly affective" and "mainly schizophrenic" subtypes (Aubert & Rush, 1996).

It is perhaps paradoxical to create a distinct clinical entity that demarcates the overlapping and nebulous area between two other disorders. Schizoaffective disorder might be best understood as an inherently ambiguous condition that occupies the overlapping boundary between the categories of schizophrenia and mood disorder (Blacker & Tsuang, 1992). It could be a phenotypic variation of either schizophrenia or mood disorder that over time crosses the boundaries between these categories or a genetic interform that occupies their border (Kendler, Neale, & Walsh, 1995). Schizoaffective disorder may not itself be a distinct condition: It may represent instead an inevitable point of confusion in the effort to demarcate a clear, unambiguous distinction between the overlapping schizophrenic, mood, and psychotic disorders.

*Mixed anxiety-depressive disorder.* Mixed anxiety-depressive disorder (MADD) may rival schizoaffective disorder in the ambiguity of its classification. MADD was developed in recognition that a substantial number of persons have clinically significant mood and anxiety disorder symptomatology yet fall below the thresholds for any existing mood or anxiety diagnosis (Barlow & Campbell, 2000). Persons diagnosed with mixed anxiety-depressive disorder have both anxious and depressive symptoms that warrant clinical intervention, but they cannot be comfortably or distinctly diagnosed with either an anxiety or a mood disorder (Tyrer, Seivewright, & Johnson, 2003). A field trial of a proposed criterion set for MADD was conducted for *DSM–IV* (Zinbarg et al., 1998). This study sampled 7 sites, including over 550 persons currently receiving treatment for a mood or an anxiety disorder (or both) from 5 primary care and 2 psychiatric outpatient sites. Zinbarg et al. (1998) reported that "patients presenting with currently subdefinitional threshold affective symptoms appear to be at least as common as patients with several of the *DSM–III–R* anxiety and depressive disorders" (p. 754). "The results of the profile analysis suggest that a nonspecific pattern of anxiety and depressed symptoms is the modal presentation among the patients with currently subdefinitional threshold symptoms" (Zinbarg et al., 1998, p. 754). The conclusion of the Mood Disorders Work Group was that "the symptom presentation of these patients appeared nearly equally balanced with regard to symptoms commonly found in anxiety and depressive disorders so that this group is listed under anxiety disorder NOS and cross-referenced to depressive disorder NOS" (Rush, 1998, p. 1023).

*DSM–IV* must classify MADD as one distinct disorder. The choices for *DSM–IV* were either anxiety disorder or a mood disorder, but there was no compelling basis for either selection. A further irony is that a substantial proportion of the empirical basis for including MADD in *DSM–IV* was obtained from research on the general personality trait of neuroticism (Barlow & Campbell, 2000; Clark & Watson, 1991). Neuroticism is a general personality disposition to experience negative affect, including anxiety, depression, and anger, that is distributed throughout the general population (McCrae & Costa, 1999). MADD could then be reasonably classified as a personality disorder, as well as a mood or an anxiety disorder.

## Research on Categorical Versus Dimensional Models

The failings of a categorical diagnosis suggest, but do not require, that a dimensional model of classification would provide a more valid description of psychopathology. A dimensional

model can address effectively the excessive co-occurrences and illusory boundaries generated by the existing diagnostic categories. Nevertheless, it remains a point of debate whether a dimensional model of classification provides a more valid description and classification of psychopathology.

A considerable amount of research is focused specifically on whether mental disorders are best classified dimensionally or categorically, and it is noteworthy that this extensive research spans the entire *DSM–IV* (Widiger & Coker, 2003). Space limitations prohibit a comprehensive summary of this vast literature. We illustrate it here with respect to studies on the validity of the dimensional and categorical distinction between normal and abnormal personality functioning, but it is important to appreciate that comparable research is being conducted for mood, psychotic, anxiety, substance use, eating, and other domains of psychopathology (e.g., see Flett, Vredenburg, & Krames, 1997).

### Personality Disorder Research

A wide variety of statistical and methodological approaches for addressing the validity of categorical and dimensional models of classification have been used, including (but not limited to) the search for bimodality, discrete breaks, and reproducibility of latent structures across groups, as well as latent class, item response, taxometric, and admixture analyses (Klein & Riso, 1993; Kraemer, Noda, & O'Hara, 2004; Ruscio & Ruscio, 2004; Sher & Trull, 1996). No particular study, or method of study, will provide conclusive results. The conclusion that a dimensional model provides a more valid description and classification of psychopathology will be reached through the cumulative and converging impact of construct validation studies that address different assumptions and hypotheses of these alternative models (Meehl, 1986; Weimer, 1979).

For example, Livesley, Jang, and Vernon (1998) compared the phenotypic and genetic structure of a comprehensive set of personality disorder symptoms in samples of 656 personality disordered patients, 939 general community participants, and 686 twin pairs. Principal-components analysis yielded four broad dimensions (emotional dysregulation, dissocial behavior, inhibitedness, and compulsivity) that were replicated across all three samples. Multivariate genetic analyses also yielded the same four factors. "The stable structure of traits across clinical and nonclinical samples is consistent with dimensional representations of personality disorders" (Livesley et al., 1998, p. 941). In sum, the structure and heritability of personality psychopathology are as evident within general community samples of persons lacking the disorders as they are within clinical samples.

Livesley et al. (1998) also noted how "the higher-order traits of personality disorder strongly resemble dimensions of normal personality" (p. 941). A considerable amount of research has supported the existence of the FFM domains and facets of general personality functioning (McCrae & Costa, 1999). The first four of these domains (i.e., extraversion, agreeableness, conscientiousness, and neuroticism) correspond quite closely to the four domains of maladaptive personality functioning identified by Livesley et al. within the *DSM–IV*. *Emotional dysregulation* (defined by affective lability, self-harm, anxiousness, and identity problems), corresponds with FFM *neuroticism* (including such traits as fearfulness, depressiveness, anxiousness, anger, guilt, self-consciousness,

and vulnerability); the *dissocial domain* (defined by interpersonal hostility, judgmental attitudes, callousness, criminal behavior, and conduct problems) corresponds with FFM *antagonism* (which includes such traits as deceptiveness, exploitation, aggression, oppositionality, arrogance, and callousness); *inhibitedness* (defined by intimacy problems and restricted affect) corresponds with FFM *introversion* (which includes such traits as placidity, withdrawal, reservation, aloofness, and passivity); and *compulsivity* (defined by the single scale of compulsivity) corresponds with FFM *conscientiousness* (which includes such traits as perfectionism, dutifulness, industriousness, discipline, deliberation, and organization). It is "striking that an extensive history of research to develop a dimensional model of normal personality functioning that has been confined to community populations is so closely congruent with a model that was derived from an analysis confined to personality disorder symptoms" (Widiger, 1998, p. 865).

Clark, Livesley, Schroeder and Irish (1996) conducted a joint factor analysis of the 18 dimensions of the *DSM–IV* symptoms identified by Livesley et al. (1998), along with the 22 symptom scales included within the three dimensional model of Clark (1993). Clark et al. (1996) concluded that their analyses yielded a four-factor solution "which corresponded to the well-established dimensions of neuroticism, introversion, (dis)agreeableness (aggression-hostility), and (low) conscientiousness (impulsive sensation seeking)" (Clark et al., 1996, p. 300).

Joint factor analyses of measures of the FFM and comprehensive representations of personality disorder symptoms have consistently identified a common underlying structure (Cannon, Turkheimer & Oltmanns, 2003; Clark & Livesley, 2002; Widiger & Costa, 2002). "The evidence suggests that personality disorders are not characterized by functioning that differs in quality from normal functioning; rather, personality disorder can be described with traits or dimensions that are descriptive of personality, both disordered and normal" (Schroeder, Wormworth, & Livesley, 1992, p. 52). More specifically, "the results of [our] study largely confirm our expectations that these dimensions of personality disorder are closely related to the Big Five factors of normal personality" (Schroeder et al., 1992, p. 52). Reviews of general personality research also "suggest that the Big Three and Big Five models define a common 'Big Four' space" (Watson, Clark, & Harkness, 1994, p. 24). Additional support for a common four-factor structure across normal and abnormal personality functioning is provided by Austin and Deary (2000) and Mulder and Joyce (1997).

The four-factor models fail only to include the smallest, fifth domain of the FFM, characterized as openness to experience (unconventionality) or within the Personality Psychopathology-Five model as psychoticism, including illusions, misperceptions, perceptual aberrations, and magical ideation (Harkness, McNulty, & Ben-Porath, 1995). There are subscales within dimensional models of personality disorder that load on this factor (e.g., schizotypal thought and perceptual cognitive distortion; Clark & Livesley, 2002). However, it appears to be the case that when this domain is narrowly defined as simply cognitive–perceptual aberrations, scales within this domain either load on other factors (typically negative affectivity) or they define a factor that is so small that it might not appear to be worth identifying (Austin & Deary, 2000; Clark et al., 1996).

Widiger and Costa (2002) summarized the results of over 50 published studies that have confirmed that the personality disorders included within the *DSM–IV* do appear to be maladaptive variants of the domains and facets of the FFM (e.g., Reynolds & Clark, 2001; Trull, Widiger, & Burr, 2001). Saulsman and Page (2004) conducted a meta-analysis of 15 of these studies and concluded that "the results showed that each [personality] disorder displays a five-factor model profile that is meaningful and predictable given its unique diagnostic criteria" (p. 1055).

Quite a few FFM personality disorder studies have since been published that were not included with the reviews of Saulsman and Page (2004) and Widiger and Costa (2002). A few will be noted here. For example, relatively weaker support for the FFM conceptualization of the personality disorders has at times been obtained for the dependent, obsessive–compulsive, and schizotypal personality disorders. Haigler and Widiger (2001) demonstrated empirically that these findings could be due largely to the absence of adequate representation of the maladaptive variants of the domains of agreeableness, conscientiousness, and openness within the predominant measure of the FFM, the NEO PI–R (Costa & McCrae, 1992). Haigler and Widiger revised existing NEO PI–R items by inserting words to indicate that the behavior described within the item was excessive, extreme, or maladaptive. The content of the items was not otherwise altered. This experimental manipulation resulted in quite substantial correlations of agreeableness with dependency, conscientiousness with the obsessive–compulsive personality disorder, and (to a somewhat lesser extent) openness with schizotypal personality disorder. The results of the study by Haigler and Widiger (2001) "offer further support for the hypothesis that personality disorders are maladaptive variants of normal personality traits by indicating that correlations of NEO PI–R Conscientiousness, Agreeableness, and Openness scales with obsessive–compulsive, dependent, and schizotypal symptomatology would be obtained by simply altering existing NEO PI–R. items that describe desirable, adaptive behaviors or traits into items that describe undesirable, maladaptive variants of the same traits" (p. 356).

Warner et al. (2004) considered the role of FFM personality traits in accounting for the temporal stability of personality disorder symptoms. Using data obtained from the Collaborative Longitudinal Study of Personality Disorders, they reported that

> there is a specific temporal relationship between traits and disorder whereby changes in the [FFM] personality traits hypothesized to underlie personality disorders lead to subsequent changes in the disorder [but] this relationship does not seem to hold in the opposite direction, which supports the contention that personality disorders stem from particular constellations of personality traits. (Warner et al., 2004, pp. 222–223)

Miller and Lynam (2003) demonstrated that a quantitative measure of the extent to which a person's FFM personality trait profile matched the hypothesized FFM profile of psychopathy, reproduced the findings commonly reported for psychopathy, including drug usage, delinquency, risky sex, aggression, and several laboratory assessments of associated pathologies, including willingness to delay gratification in a time discounting task and a preference for aggressive responses in a social-information processing paradigm. Trull, Widiger, Lynam, and Costa (2003) similarly demonstrated that the extent to which a person's FFM personality

trait profile matched the hypothesized FFM profile of borderline personality disorder correlated as highly with measures of borderline personality disorder as the latter correlated with one another. The FFM borderline index even demonstrated incremental validity in accounting for borderline psychopathology beyond the variance that was explained by a 2-hr semistructured interview devoted to the assessment of this personality disorder. In sum, the extent to which a person's FFM profile of personality traits is consistent with hypothesized FFM profiles for a respective personality disorder reproduces the nomological net of predictions that has been hypothesized for that personality disorder (Lynam, 2002; Miller & Lynam, 2003; Trull et al., 2003).

## Taxometric Research

An increasingly popular approach for determining whether a dimensional or a categorical model of classification is more valid is through the use of taxometric analyses, otherwise known as coherent cut kinetics (Meehl, 2004). Particular attention should perhaps be given to this approach because of its increasing popularity and because its intention is to test explicitly the validity of dimensional and categorical models. It is also one of the few methods of study that has provided support for the categorical model.

Taxometric analyses determine whether a particular set of indicators covary in a manner that is more consistent with a continuous distribution or a categorical distinction (Haslam, 2003; Lenzenweger, 2004; Ruscio & Ruscio, 2004). Taxometric studies have been conducted for the schizotypal, antisocial, and borderline personality disorders (Haslam, 2003). The implications of these findings, however, are as yet unclear. One difficulty is that this numerical approach is still quite novel, and its robustness and fallibility are not yet well understood (Cole, 2004; Lenzenweger, 2004; Ruscio & Ruscio, 2004). Consider, for example, the taxometric studies of borderline personality disorder. The first such study was conducted by Trull, Widiger, and Guthrie (1990). Trull et al. (1990) obtained a right-end peak with their maximum covariation analysis, which they interpreted as being relatively more consistent with a dimensional than a categorical model. Two unpublished studies summarized by Haslam (2003) also yielded results consistent with a dimensional rather than a categorical interpretation. Haslam (2003), however, summarized the results of a much more extensive but not yet published study that replicated the right-end peak of Trull et al. and that "yielded strong support for the taxonicity of borderline personality disorder [with] three distinct analyses (maximum covariation, mean above minus mean below a cut, and mixture modeling) yielding plainly taxonic results and highly convergent base rate estimates" (p. 82). However, by the time this study by Rothschild and colleagues was in fact published, these authors reached the opposite conclusion. Rothschild, Cleland, Haslam, and Zimmerman (2003) did replicate the right-end peak of Trull et al. but concluded that the results "indicated that borderline personality disorder does not represent a latent category" (p. 657); they concluded that the findings "support a dimensional view of the latent structure of borderline personality disorder" (p. 665). The reversal in interpretation was due largely to a further exploration of the ambiguous implications of right-end peaks and skewed indicators (Ruscio, Ruscio, & Keane, 2004).

Taxometric studies of psychopathy have also been problematic. Harris, Rice, and Quinsey (1994) submitted items from the Psychopathy Checklist—Revised (PCL–R; Hare, 2003) to a series of a taxometric analyses. Beauchaine (2003) has suggested that "it is imperative that [taxomtric researchers] select indicators that are reasonably specific to the psychopathy construct" (p. 511). "Candidates might include manipulativeness, callousness, lack of empathy, and certain physiological markers of underarousal" (Beauchaine, 2003, p. 511) that have been considered to be central to or provide the core features of psychopathy (Hare, 2003). However, the Harris et al. analysis of the complete set of PCL–R items did not identify a latent taxon, nor did the analyses of the central or core features of psychopathy. The taxon was identified instead when the analyses were confined to the PCL–R items that are said to assess indicators of an antisocial, deviant lifestyle or a history of childhood conduct problems. Hare (2003) has subsequently questioned the methodology of the study, suggesting that "their conclusion that the psychopathy taxon was primarily defined by antisocial behaviors and early behavioral problems may have been an artifact stemming from the exclusion of interview data from the PCL–R assessments" (p. 9). Skilling, Quinsey, and Craig (2001) conducted a further taxometric study of child and adolescent versions of the PCL–R and obtained results consistent with a taxon for both the antisocial behaviors and the core features of psychopathy. On the other hand, Marcus, John, and Edens (in press) reported taxometric results consistent with a dimensional interpretation when using responses obtained from a self-report psychopathy inventory administered to 309 jail and prison inmates.

Many taxometric analyses, unlike most statistical techniques, do not address sample fluctuation, failing to consider, for example, standard errors of measurement. Taxonic results can also be due simply to cognitive biases or assumptions of the raters (Beauchaine & Waters, 2003), the confinement of the analyses to items preselected to produce a taxonic result (Widiger, 2001), or the sampling from divergent populations (Beauchaine, 2003). Taxometric analyses can provide very informative findings with respect to the potential existence of a meaningful diagnostic distinction (Meehl, 2001) but an important goal of future research will be the further recognition of their fallibilities and how best to address them (Cole, 2004; Lenzenweger, 2004; Ruscio & Ruscio, 2004).

Taxonic results have been obtained with indicators of schizotypia (Lenzenweger, 2004), but even here the nature of this latent taxon is unclear (Haslam, 2003). Taxometric techniques do not necessarily identify taxa that suggest the presence of a specific pathology, etiology, or treatment, as traditionally inferred from or sought for a diagnostic category (Frances et al., 1995; Kendell, 1975). On the contrary,

> employing the formal-numerical definition of taxonicity results in a large number of behavioral taxa that are environmental mold types, rather than having as their specific etiology a germ, a gene, a dietary deficiency, or a specific traumatic life event such as childhood sexual abuse or a brain injury. (Meehl, 2001, p. 510)

Being a Trotskyist, a bridge player, or a surgeon would be a strong and unambiguous taxon from the perspective of taxometric analyses as long as the indicators for these taxa were confined to the behaviors or beliefs that are largely specific to the membership in the respective category (e.g., for the bridge playing taxon, familiarity with such terms as renege, vulnerable, and slough).

> But a person can become a Trotskyist for a list of completely disparate reasons (e.g., being a disillusioned Stalinist, having a lover who will not marry you unless you convert, being a Norman Thomas socialist who comes to feel like a useless 'parlor pink,' being a Minneapolis, MN, truck driver whose successful strike of 1934 was led by the Trotskyists). (Meehl, 2001, p. 510)

The obtainment of a taxonic result may have no more meaning than would be present for the literally thousands of categories that can be constructed for every profession, hobby, skill, book, movie, or belief system (Widiger, 2001). "How much and what kind of surplus meaning obtains from a clear taxonic finding depends on the amount and kind of information available and the taxometrician's risk-taking proclivities" (Meehl, 2004, p. 41). "Statistically identified taxa should be viewed as provisional entities that then must be subjected to the normal process of construct validation" (Watson, 2003, p. 304). For example, readers might infer from the identification of a taxon for indicators of schizotypia that this disorder probably results from a specific etiology, but this could very well be mistaken (Lenzenweger, 2003, 2004; Widiger, 2003a). The taxometric results for schizotypia must be considered in the context of additional evidence regarding the etiology and pathology of the schizophrenia spectrum. Schizophrenia might not itself be adequately characterized as a categorically distinct condition (Andreasen, 1997; Appelbaum, Robbins, & Roth, 1999; Bell, Dudgeon, McGorry, & Jackson, 1998; Crow, 1998; Toomey, Faraone, Simpson, & Tsuang, 1998). Molecular genetic studies have indicated that it is "most probable that genetic susceptibility to schizophrenic psychoses is polygenetic, and that their effects are dependent on interaction with physical and psychosocial environmental factors" (Portin & Alanen, 1997, p. 73). "A dimensional view of schizophrenia is especially consistent with multigene models of inheritance, and these models provide the best account of the familial transmission of schizophrenia" (Tsuang, Stone, & Farone, 2000, p. 1043).

## Clinical Utility

The authors of each edition of the *DSM* have been concerned primarily with its reliability and validity (Spitzer et al., 1980), but clinical utility might be given more consideration in the development of *DSM–V* (First et al., 2004). The emphasis on validity has been appropriate, as a diagnostic manual with no validity will have no clinical utility. A diagnostic manual governed substantially by matters of clinical utility could be unduly susceptible to idiosyncratic or transient professional concerns that might undermine the credibility or validity of the diagnostic system. On the other hand, a manual that cannot be used effectively in clinical practice might be as useless as an invalid diagnostic manual, and questions have been raised concerning the clinical utility of dimensional models of classification (Sprock, 2003).

Categorical models of classification are at times preferred because they appear to be easier to use (Frances et al., 1995). One diagnostic label can convey a considerable amount of useful clinical information in a vivid and succinct manner. Dimensional models of classification are inherently more complex than diagnostic categories in the sense that they generally provide more

specific and precise information. It is simpler to inform a colleague that a patient has a borderline personality disorder than to describe the patient in terms of the 30 facets of the FFM.

However, the existing diagnostic categories are in fact frustrating and troublesome to clinicians in part because they provide inaccurate and misleading descriptions (Kass, Skodol, Charles, Spitzer, & Williams, 1985; Maser, Kaelber, & Weise, 1991). Clinicians could find a dimensional model of classification to be easier to use because it provides a more valid and internally consistent means with which to describe a particular patient's psychopathology (Kass et al., 1985). A dimensional classification might also be less cumbersome because it would not require the assessment of numerous diagnostic criteria from overlapping categories in a frustratingly unsuccessful effort to make illusory distinctions.

Thousands of valid categorical distinctions can be made among existing professions, hobbies, skills, and belief systems (Meehl, 2001; Widiger, 2001). "The largest number of taxa is found in occupations, the *Dictionary of Occupational Titles* (U.S. Department of Labor, 1991) which has more than 20,000 entries" (Meehl, 2001, p. 510). A diagnostic system with this many categories might be too cumbersome for a clinician to use in a reliable and valid manner. It could in fact be more pragmatic to use a much smaller set of underlying dimensions of functioning that cut across these categories to provide a more succinct and straightforward means with which to describe and diagnose a particular patient's psychopathology (Haslam, 2002).

The most popular diagnosis in many clinical settings is the wastebasket category of *not otherwise specified* (NOS). NOS is generally used when a clinician has determined that a mental disorder is present, but the person fails to meet the diagnostic criteria for one of the existing diagnostic categories (American Psychiatric Association, 2000). That NOS is used so frequently suggests that the existing diagnostic categories lack clinical utility (Clark, Watson, & Reynolds, 1995). There are, of course, other reasons for diagnosing a patient with NOS (e.g., failure to provide an adequate diagnostic assessment), but the most common reason does appear to be inadequate diagnostic coverage (Clark et al., 1995; Verheul & Widiger, in press). A substantial number of persons are seeking treatment for conditions that fail to meet the existing diagnostic criteria for one of the existing anxiety, mood, eating, or personality disorders (e.g., Magruder & Calderone, 2000; Shisslak, Crago, & Estes, 1995; Stein, Walker, Hazen, & Forde, 1997; Westen & Arkowitz-Westen, 1998).

Consider, for example, subthreshold depression (Pincus, McQueen, & Elinson, 2003). "The majority of cases of clinical depression go unrecognized and untreated" (Munoz, Hollon, McGrath, Rehm, & VandenBos, 1994, p. 42). Persons with subthreshold levels of depression exhibit high rates of health care use and require substantial medical care costs (Johnson, Weissman, & Klerman, 1992). Nearly half of all pharmacologic interventions for depression are prescribed by primary care physicians, with many of these patients failing to meet diagnostic criteria for any existing mood disorder diagnosis (Merikangas, Ernst, Maier, Hoyer, & Angst, 1996).

There is currently no consistently applied or well-understood threshold for the presence of a categorical diagnosis. Each revision to the manual creates the confusion generated by the fact that seemingly minor changes to diagnostic criterion sets often result in unexpected and quite substantial shifts in prevalence rates that profoundly complicate scientific theory and public health decisions (Blashfield, Blum, & Pfohl, 1992; Narrow, Rae, Robins, & Regier, 2002). "A major goal of the next generation of psychiatric epidemiology will be to establish a more precise and clinically relevant baseline than was accomplished by the Epidemiologic Catchment Area program and the National Comorbidity Survey" (Regier & Narrow, 2002, p. 28). A dimensional model of classification could be more effective in addressing this concern by avoiding the misleading, unstable, and illusory efforts to carve psychological functioning at nonexistent discrete joints. A dimensional model could also provide an explicit means for recognizing, assessing, and tracking subthreshold conditions (Hinshaw, Lahey, & Hart, 1993) and might facilitate the development of more precise, consistent, and uniform points of demarcation between normal and abnormal psychological functioning (Kessler, 2002; Kraemer et al., 2004; Regier & Narrow, 2002).

Clinical decisions are categorical. Whether to provide a medication, hospitalization, or insurance coverage is a categorical decision. Specific points of demarcation are needed along dimensions to guide clinical decisions. If these categorical distinctions inevitably occur, then it might seem more useful to use categorical diagnoses. However, the cutoff points that are optimal for one clinical decision, such as hospitalization, are unlikely to be optimal for another, such as medication (Kendler, 1990). In addition, psychosocial and pharmacologic interventions, with few exceptions, target and have effects upon a number of different disorders rather than being specific to individual diagnostic categories. "Lack of treatment specificity is the rule rather than the exception" (Kupfer et al., 2002, p. xviii). Persons who share the same categorical diagnosis can differ substantially in terms of the predominant features of the disorder. A dimensional model of classification could provide a more specific and individualized profile description of a patient's psychopathology that may in turn have more differentiated and specific treatment implications. Different cutoff points could also be placed along distributions of anxious, depressive, introverted, disinhibited, and other dimensions of functioning that could be more meaningful and specific to different social and clinical decisions.

## Conclusions

In the past 20 years . . . the disease entity assumption has been increasingly questioned as evidence has accumulated that prototypical mental disorders such as major depressive disorder, anxiety disorders, schizophrenia, and bipolar disorder seem to merge imperceptibly both into one another and into normality . . . with no demonstrable natural boundaries or zones of rarity in between." (Rounsaville et al., 2002, p. 12)

The modern effort to demarcate a taxonomy of distinct clinical conditions is often traced to Kraepelin (1917), but Kraepelin had himself acknowledged that "wherever we try to mark out the frontier between mental health and disease, we find a neutral territory, in which the imperceptible change from the realm of normal life to that of obvious derangement takes place" (p. 295).

Most mental disorders appear to be the result of a complex interaction of an array of interacting biological vulnerabilities and dispositions and environmental, psychosocial events (Rutter, 2003). For a categorical diagnosis to relate specifically to a par-

ticular etiology, the pathology would have to have been largely resilient to the influence of many other genetic and environmental influences (Widiger & Sankis, 2000). The symptoms and pathologies of mental disorders appear to be, in contrast, highly responsive to a wide variety of neurochemical, interpersonal, cognitive, and other mediating and moderating variables that help to develop, shape, and form a particular individual's psychopathology profile (Andreasen, 1997; Rutter, 2003; Tsuang et al., 2000). This complex etiological history and individual psychopathology profile are unlikely to be well described by a single diagnostic category.

A model for the future might be provided by one of the more well-established diagnoses, mental retardation. A dimensional classification of mental disorders might be viewed by some as a radical departure, but *DSM–IV* already includes a strong precedent. The point of demarcation for the diagnosis of mental retardation is an arbitrary, quantitative distinction along the normally distributed levels of hierarchically and multifactorially defined intelligence. The current point of demarcation is an IQ of 70, along with a clinically significant level of impairment. This point of demarcation is arbitrary in the sense that it does not carve nature at a discrete joint, but it was not randomly or mindlessly chosen (Haslam, 2002). It is a well-reasoned and defensible selection that was informed by the impairments in functioning commonly associated with an IQ of 70 or below (Zachar, 2000).

The *DSM–IV* classification of maladaptive levels of intelligence is also a useful model because it illustrates how categorical and dimensional diagnoses are not necessarily mutually exclusive. There are instances of mental retardation that have specific etiologies. Recognizing that psychopathology is generally best classified along continuous distributions does not imply that instances of qualitatively distinct conditions would not exist or could not be recognized. On the other hand, the categorical diagnoses in the case of mental retardation are generally placed on Axis III as physical disorders (e.g., Down's syndrome) that can be traced to a specific biological event (i.e., trisomy 21), and the mental retardation of persons with these categorically distinct disorders is still described well in terms of the continuously distributed cognitive impairments.

A general factor of intelligence (ability to reason, plan, solve, learn, and comprehend information) saturates most to all measures of cognitive ability (as a temperament of neuroticism might be common to many anxiety disorders), but it can in turn be further differentiated with respect to particular facets (e.g., quantitative, spatial, and verbal intelligence) that can themselves be in turn further differentiated into more specific components (Lubinski, 2004). The domain of intelligence is distributed as a hierarchical, multifactorial continuous variable, as most persons' level of intelligence, including most of those with mental retardation, is the result of a complex interaction of multiple genetic, fetal and infant development, and environmental influences (Lubinski, 2004; Neisser et al., 1996). There are no discrete breaks in its distribution that would provide an absolute distinction between normal and abnormal intelligence.

The diagnosis of anxiety, sleep, sexual, substance, mood, psychotic, personality, and other mental disorders should perhaps follow the lead provided by mental retardation (Widiger & Coker, 2003). Widiger, Costa, and McCrae (2002), for example, propose a comparable four-step procedure for the diagnosis of personality disorders. A detailed description of this diagnostic system is be-

yond the space limitations of this article. We only note briefly here that the first step is to obtain a hierarchical and multifactorial description of an individual's general personality functioning, providing therein a reasonably comprehensive description of the person's adaptive as well as maladaptive personality traits. The second step is to identify social and occupational impairments and distress associated with the individual's characteristic personality traits. Widiger et al. (2002) identify common impairments associated with each of the 60 poles of the 30 facets of the FFM, including (but not limited to) *DSM–IV* personality disorder symptomatology. The third step is to determine whether the dysfunction and distress reach a clinically significant level of impairment (Regier & Narrow, 2002). The fourth step is a quantitative matching of the individual's personality profile to prototypic profiles of diagnostic constructs. This last step is provided for clinicians and researchers who wish to continue to provide single diagnostic labels to characterize a person's personality profile. To the extent that an individual's profile does match the FFM profile of a prototypic case, a single term (e.g., psychopathic) would provide a succinct means of communication (Lynam, 2002). However, prototypic profiles might be quite rare within clinical practice. In such cases, the matching can serve to indicate the extent to which any particular diagnostic category is adequately descriptive.

"*DSM–IV* is a categorical classification that divides mental disorders into types based on criterion sets with defining features" (American Psychiatric Association, 2000, p. xxxi). We hope that our article has raised at least some doubts within the minds of the reader as to the validity and utility of the categorical diagnostic system. We are not suggesting that the next edition of the *DSM* abandon all diagnostic categories in favor of a dimensional model. However, we do suggest that further attention should be given in the next edition of the *DSM* of the potential validity and utility of alternative dimensional models and that researchers work toward the further development of these alternative dimensional models.

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