

Measurement to Improve Treatment Delivery: A Commentary on the HiTOP Measure Development Project

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Abstract

The focus on this commentary will be on how dimensional models of psychopathology, particularly HiTOP model, have the potential to significantly streamline treatment efforts and increase the likelihood that evidence-based interventions are more widely integrated in clinical practice. The approach to assessment adopted by the HiTOP consortium is likely to have an outsized impact on whether these innovations are adopted in routine clinical practice. Toward that end, I provide suggestions for a measurement strategy that can maximize clinical utility. In particular, the tension between creating items that reflect all phenomena at the sign/symptom level to refine our understanding of relationships among psychopathological constructs and creating a measure that is suitable for clinical practice is explored.

Keywords

HiTOP, clinical utility, measurement development

The predominant approach to mental health classification, exemplified by the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; *DSM-III*; American Psychiatric Association [APA], 1980; *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; APA, 1994; *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA, 2013), involves the assignment of categorical diagnoses on the basis of clear yes/no criteria. Symptom sets associated with each diagnosis, introduced with the publication of *DSM-III* (APA, 1980), significantly increased diagnostic reliability (Kendell & Jablensky, 2003) relative to the previous system that used narrative descriptions of broad, nonempirical groupings (i.e., neuroses and psychoses). However, as Simms and colleagues (in press) clearly articulate, the categorical approach to grouping mental health disorders is not without shortcomings. For example, many diagnoses share similar criteria and often co-occur (e.g., T. A. Brown et al., 2001), and patients assigned to the same diagnostic category can exhibit heterogeneous, sometimes nonoverlapping constellations of symptoms (Kotov et al., 2017). Moreover, *DSM* diagnostic thresholds do not account for subclinical presentations, and the overreliance on “not otherwise specified” classifications suggest that extant categories do not adequately capture real-world presentations (Barlow et al., 2014). Taken together, these issues suggest that improved diagnostic reliability may have come at the expense of validity (Andrews, 1990, 1996; Blashfield et al., 2014; Lilienfeld, 2014).

Of course, the way our field understands psychopathology, entrenched in its diagnostic system, has an enormous influence on the way that mental health conditions are assessed and treated. For example, since the publication of *DSM-III* (APA, 1980), psychological assessment tools largely aim to differentiate among categorical diagnoses (i.e., semistructured diagnostic interviews) or measure the intensity of a single disorder. Treatment development and efficacy testing has followed suit, with the emergence of numerous protocols designed to address discrete categorical diagnoses (Barlow, 1996, 2004; Barlow et al., 2000; Heimberg et al., 1998). However, despite the increased availability in empirically-supported treatment approaches (i.e., disorder-specific interventions that lead to improvements that single disorder), there have been some unintended consequences. First, given the high degree of diagnostic comorbidity among *DSM* disorders (e.g., T. A. Brown et al., 2001; Kessler et al., 1998), protocols focused on single diagnoses do not reflect the clinical reality faced by patients and therapists. Indeed, it is troubling that few diagnosis-specific treatments provide guidance on how to address commonly co-occurring conditions, especially

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because some studies have shown that when comorbid disorders are present, single-diagnosis protocols demonstrate poorer outcomes for the primary, targeted disorder (e.g., Craske et al., 2007; Gibbons & DeRubeis, 2008; Steketee et al., 2001). Moreover, numerous treatment protocols each targeting a single disorder substantially increases therapist burden. To provide care consistent with many empirically supported approaches, therapists may need to complete costly training for multiple interventions (McHugh & Barlow, 2010), perhaps dampening their enthusiasm to use them.

In an effort to address the limits of categorical classification, some have suggested a movement toward a system that includes the assessment of dimensional elements (e.g., Maser et al., 2009). Prominent examples of dimensional classification systems include the *DSM-5* Alternative Model of Personality Disorders (AMPD; APA, 2013) and T. A. Brown and Barlow's (2009) proposal for emotional disorders, though both of these approaches are limited in scope (i.e., assessment of personality disorders and internalizing disorders, respectively). More recently, a consortium of researchers developed the Hierarchical Taxonomy of Psychopathology (HiTOP; Kotov et al., 2017), a comprehensive nosological system based on quantitative relationships among the range of psychopathological constructs. As has historically been the case, new nosological proposals are often followed by an attempt to assess psychopathology in a manner that conforms to the new perspective. Thus, it no surprise that members of the HiTOP consortium has formed working groups aimed at measuring psychopathology that is in line with their dimensional model (Cicero et al., 2021; Sellbom et al., in press; Simms et al., in press; Watson et al., 2021; Zimmerman et al., in press).

The focus on this commentary will be on how dimensional models of psychopathology, particularly HiTOP model, have the potential to significantly streamline treatment efforts and increase the likelihood that evidence-based interventions are more widely integrated in clinical practice. The approach to assessment adopted by the HiTOP consortium (Simms et al., in press) is likely to have an outsized impact on whether these innovations are adopted in routine clinical practice. Toward that end, I provide suggestions for a measurement strategy that can maximize clinical utility. In particular, the tension between creating items that reflect all phenomena at the sign/symptom level to refine our understanding of relationships among psychopathological constructs and creating a measure that is suitable for clinical practice is explored.

How Can HiTOP Improve Treatment Delivery?

As its name suggests HiTOP is organized hierarchically such that it can be described at various levels (see Figure 1

in Simms et al., in press). At the top of the hierarchy is a *superfactor* of general psychopathology, often referred to as the *p* factor (Kotov et al., 2017). Organized beneath *p*, the HiTOP model also contains broad factors, called *spectra*, that distinguish between major forms of psychopathology. Spectra are defined as the most basic factors of psychopathology that can be distinguished from a general predisposition to mental disorder (Kotov et al., 2017). The next level of the HiTOP model, beneath spectra, is referred to as "subfactors," which disaggregates internalizing into sexual problems, eating problems, fear, and distress, and breaks externalizing into substance abuse and antisocial behavior (Kotov et al., 2017). Next, subfactors are further broken down into syndromes/disorders that roughly correspond to *DSM* categories (e.g., the fear subfactor is comprised of agoraphobia, obsessive-compulsive disorder, panic disorder, social anxiety disorder, and specific phobia). The HiTOP consortium notes research establishing these levels within their model is provisional (Brandes & Tackett, 2019; Kotov et al., 2017).

With regard to how a classification system like HiTOP can improve the provision of therapeutic services, focusing on the spectra level may hold the most promise. Six nomothetic dimensions represent far fewer unique targets of treatment than the hundreds of categorical diagnoses in the *DSM* system. Insofar as the cost- and training-burden associated with learning discrete protocols for each categorical disorder limits widespread dissemination of evidence-based care, fewer treatments that target a limited number of higher-order dimensions (and lead to simultaneous symptom improvement across a range of condition) has the potential to significantly streamline care. In addition, because the HiTOP spectra account for the covariance among the lower-order subfactors, syndromes, and sign/symptoms, focusing treatment at this level (e.g., internalizing) may result in efficient, simultaneous improvement on co-occurring conditions within that dimension (e.g., generalized anxiety disorder and panic disorder).

Although it may seem abstract to target higher-order dimensions directly in treatment, there has been increasing interest, perhaps due to shifts in funding priorities (e.g., Insel et al., 2010), on identifying mechanisms implicated across larger classes of *DSM* disorders, along with the development of transdiagnostic interventions to address these processes (Hofmann & Hayes, 2019; Sauer-Zavala et al., 2017). Indeed, there is emerging evidence to support the efficacy of treatments that target HiTOP spectra. For example, the Unified Protocol (Barlow et al., 2018) was developed to be address functional processes that maintain neuroticism¹ (Sauer-Zavala, Fournier et al., 2020) and is associated with reductions in symptoms across disorders falling within the internalizing spectrum (i.e., anxiety disorders, obsessive-compulsive and related disorders, depressive disorders, post-traumatic stress disorder, borderline personality disorder,

eating disorders, and bipolar disorder; Cassiello-Robbins et al., 2020). There are varying levels of support for interventions to address the other five spectra (see Sauer-Zavala & Barlow, 2021; Sauer-Zavala, Southward et al., 2020); however, wider adoption of the HiTOP model might promote treatment efforts for these higher-order constructs much in the way *DSM-III* (APA, 1980) fostered the development of diagnosis-specific manuals.

In addition, hierarchical models in which dimensional scores are provided for all higher-order constructs may be particularly well-suited to ideographic case conceptualization and treatment planning. Although it may be more common for comorbid conditions to fall within the same spectra (e.g., among anxiety and depressive disorders), rates of co-occurrence among conditions on separate spectra are also high (e.g., substance use disorders and anxiety disorders). Moreover, some conditions, such as borderline personality disorder, are situated on two higher-order dimensions (i.e., internalizing and antagonistic externalizing). Thus, dimensional profiles can allow provide a summary of the processes that may be driving the expression of their symptoms. For example, in the context of BPD, if a patient's symptoms are the result of internalizing psychopathology, the treatment approach would be different than if this symptom resulted from high levels of antagonism. Of course, patients may exhibit elevations on more than one HiTOP dimension, reflecting the need for a personalized treatment plan that includes treatment elements tailored to all relevant spectra.

Of course, a one-size-fits-all treatment for internalizing symptoms, for instance, may not adequately address the nuanced differences between individual patients. Thus, an important strength of hierarchical models like HiTOP is their ability to also capture lower-order signs, symptoms, and features that might moderate response to a spectra-level intervention. For example, it is possible that a patient with melancholic symptoms of depression would not respond as well to a standard internalizing treatment (W. A. Brown, 2007). Unfortunately, the literature is sparse with regard to which signs, symptoms, and features can be used to predict whether an alternative treatment is warranted. It may be most immediately useful to concentrate treatment efforts at the spectra-level, which may reduce clinician burden and promote delivery-level efficiency until lower-order moderators are consistently identified and alternative/adjunctive interventions are evaluated.

Treatment-Relevant Considerations for Assessing HiTOP Constructs

As noted previously, the prevailing classification system for psychopathology has the potential to shape how mental health conditions are treated. Furthermore, the measurement tools that accompany such nosological schemes likely have a strong impact on clinical uptake, perhaps

determining whether a system like HiTOP is universally adopted. Thus, creating an assessment tool for HiTOP is a high stakes endeavor that, to my mind, is further complicated by dual goals of such a tool. Specifically, the HiTOP Measures Development Workgroup is tasked with creating a comprehensive assessment tool that can facilitate further study on the empirical nature of psychopathology (Simms et al., in press). This is, of course, the rationale for creating items to reflect the signs/symptoms/features level of the HiTOP system that can be subjected to further factor analyses to confirm and/or refine the model's structure. Indeed, one of the key strengths of the HiTOP consortium's approach is the humility to consider their efforts a perpetual work-in-progress. This approach has great promise for understanding hierarchical relationships across a comprehensive swatch of symptoms that have, to date, been impossible due to the fact that there are no existing measures with coverage of all these constructs. At the same time, the HiTOP consortium aims to move beyond being an intellectual exercise for researchers via implementation in routine clinical practice. The assessment needs of a clinician in a community mental health center are apt to differ from those of an academic, or even from the needs of a full-time practitioner in an academic medical center or an individual in private practice.

Given that the goal of this commentary is to provide treatment-relevant recommendations for HiTOP measurement development, my comments are aimed toward creating a questionnaire that can tell clinicians exactly what they need to know to provide the most streamlined, evidence-based care with the fewest number of items. Although, I understand the importance of creating items that reflect all phenomena at the sign/symptom level (i.e., refining our understanding of relationships among these psychopathological constructs), this degree of specificity is likely to be excessive for clinical settings for two reasons. First, to adequately capture variation in signs and symptoms, the HiTOP Measures Development Working Group have produced at least 648 items (not including the items for the disinhibited and antagonistic externalizing spectra) to be included in their Phase-2 cross-domain validation. Of course, a measure of this length would put undue to burden on treatment-seeking patients and would simply not be feasible to administer in most practice settings (Ruggero et al., 2019). Second, for many clinical presentations, knowing elevations at the spectra level is probably sufficient for treatment selection; however, as noted previously, more research is needed to determine which clinical syndromes, signs, and symptoms act as moderators that indicate when the spectra-level treatment would not be sufficient for a particular presentation.

Simms and colleagues (in press) note that developing a short form of the HiTOP assessment tool, along with allowing for modular delivery based on the needs of a given

setting, are downstream goals of the Measures Development Working Group. Although I understand that measurement development is a sequential process, it is necessary to stress the importance of considering stakeholders at various levels when creating a new innovation (in this case, a questionnaire). Too often, innovations (e.g., treatments and assessment tools) created in academic settings fail to make the jump to real-work practice applications as it is difficult to retrofit them to the demands of a busy clinic (Powell et al., 2012). Recent work on implementation science suggests that ongoing collaboration among stakeholders (e.g., researchers, clinicians, and administrators of mental health clinics) from the outset of innovation development may increase the likelihood that the HiTOP system, (and its measurement tools) are adopted and sustainably used. Although many practices currently use structured interviews and/or dedicate substantial time to assessment, many others do not, underscoring the importance of a tool that can glean key information (i.e., spectra elevations) in under 5 minutes.

As noted previously, my primary recommendation for making the HiTOP measurement tool more clinically feasible is to focus assessment at the spectra level, given the clinical utility of six broad treatment targets (versus hundreds of signs/symptoms/features). However, as Simms and colleagues (in press) note, “spectra themselves vary in size and breadth and, perhaps, importance,” suggesting the fewer items and/or less specificity may be needed for some of these higher-order dimensions relative to others. In addition, identifying (and then including items that capture) syndromes, signs, symptoms, and features that indicate when a spectra-level treatment might not adequately address a particular patient’s presentation is necessary for streamlined, efficient treatment planning. In the article describing the internalizing psychopathology subgroup’s efforts, Watson and colleagues (2021) indicate items measuring decreased need for sleep, trichotillomania, blood-injection phobia, euphoric energy, and grandiosity do not correlate as highly with measures of neuroticism, perhaps suggesting that an “internalizing treatment” might not perform as well for people exhibiting these symptoms. Of course, these recommendations are my opinions based on my experience with transdiagnostic treatment development (particularly for neuroticism/internalizing problems), along with efforts to disseminate empirically supported treatment in community practice. I strongly encourage the HiTOP consortium to consider adding implementation scientists to their team who can facilitate garnering comprehensive feedback from stakeholders at multiple levels.

Concluding Remarks

Overall, dimensional classification systems have the potential to improve psychological treatment by better reflecting

clinical reality (e.g., comorbidity and subthreshold presentations) than arbitrary diagnostic categories. The hierarchical nature of the HiTOP system is particularly attractive, given that psychopathology can be reduced to six meaningful groups that can largely be understood as resulting from shared mechanisms. Indeed, these shared mechanisms can become the focus of transdiagnostic treatment, significantly streamlining care. Of course, there will likely be instances when a broad, one-size-fits-all spectra-level treatment will not work as well for a given presentation; in these cases, HiTOP providing more specificity by allowing exploration of lower-order factors (e.g., syndromes, signs, symptoms, and features). A comprehensive HiTOP assessment tool can facilitate clinical efficiency by providing broad treatment targets that will be relevant to the vast majority of patients and enabling research on the circumstances in which they are not. However, it is important to note that the current iteration of the HiTOP assessment tool is prohibitively long and perhaps more focused on confirming/refining its underlying structural model than on its clinical applications. The inclusion of an implementation scientist (or an expert in mental health dissemination) at an early point in the development of this measure of this may help define a course of action that moves the needle in clinical practice.

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Note

1. Studies have demonstrated that internalizing is all but isomorphic with neuroticism (Griffith et al., 2010), and elevated neuroticism has shown to be a core and central feature of internalizing psychopathology (Beauchaine & McNulty, 2013).

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