Integrating psychotherapy with the Hierarchical Taxonomy of Psychopathology (HiTOP)

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In press, Journal of Psychotherapy Integration

Abstract

In this paper we present the Hierarchical Taxonomy of Psychopathology (HiTOP), an evidence-based alternative to the categorical approach to diagnostic classification with considerable promise for integrative psychotherapy research and practice. We first review issues associated with the categorical approach that may have constrained advances in psychotherapy. We next describe how the HiTOP model addresses some of these issues. We then offer suggestions regarding potentially mutual benefits of integrating HiTOP with treatment principles from the common factors literature as well as the cognitive-behavioral and relational psychotherapy traditions. We conclude by enumerating principles for psychotherapy research and practice based on the HiTOP model, which are illustrated with a case example.

Keywords: Psychodynamic; CBT; Diagnosis; HiTOP; Psychotherapy

Factors such as third-party payment, increased consumer scrutiny, and the demands of evidence-based practice placed pressure on psychologists to demonstrate the effectiveness of their services in the latter half of the 20th century (Parloff, 1979). The primary and most widely-trusted method for studying psychotherapy outcomes since that time has been the randomized controlled trial (RCT) based on medical-model diagnostic categories (Dragioti et al., 2017). Coupling the medical model with the RCT approach assumes that discrete treatments can be successfully applied to discrete conditions for therapeutic effect. For instance, although viruses and bacteria can produce similar symptoms (e.g., sore throat), an antibiotic will only effectively treat bacterial infections. When presented with a patient whose throat is sore, the physician can test for the presence of bacteria (e.g., based on a rapid antigen test) and the correct treatment applied based on the results of this test. Research aimed at identifying effective treatments is a matter of working backwards from this successful practice. People with a common condition (e.g., bacterial infection) are randomized to different interventions (e.g., ibuprofen vs. antibiotic), to see which intervention works best (e.g., the antibiotic) for reducing symptoms.

The logic of the RCT in a medical model context rests on (a) the valid identification of the condition used to select individuals into the study that is the target for treatment, and (b) treatments having different mechanisms of action. We focus on the former with respect to RCTs of psychological interventions for mental health problems. In the example above, the therapeutic effects of antibiotics would be more difficult to detect if participants were selected for a sore throat (a symptom which can be caused by virus or bacteria) rather than on the basis of test-confirmed bacterial infection. There is an analogous situation in psychopathology, insofar as mental disorder categories used to select patients for randomization in RCTs do not correspond to the empirical organization of psychiatric problems. In this article, we describe how a more

evidence-based classification of psychopathology, the *Hierarchical Taxonomy of Psychopathology* (HiTOP; Kotov et al., 2017; Krueger et al., in press), can facilitate integrative psychotherapy research and practice.

Problems with Disorder Categories for Psychotherapy Research and Practice

The scientific and clinical yield resulting from psychotherapy RCTs based on psychiatric disorder categories has been relatively unimpressive in relation to the resources that have been put toward studies of this type (Cartwright & Deaton, 2017; Westen, Novotny, & Thompson-Brenner, 2004). While it is true that RCTs have shown that adding components within packages can be beneficial (e.g., Bell, Marcus, & Goodlad, 2013), instances in which one treatment package is demonstrably superior to other thoughtfully conceived treatment packages are rare and major approaches to treatment tend to perform similarly in meta-analyses of RCTs (Ahn & Wampold, 2001; Barth et al., 2016; Cristea et al., 2017; PMR Group, 1998; Wampold et al., 2016). Conversely, research suggests that many interventions designed to treat one specific problem are beneficial for a host of other problems that are regarded as distinct in categorical models (e.g., Weitz et al., 2018).

It is understandable that clinicians in this context tend to lean on the techniques with which they are most comfortable or familiar based on their training and their sense of the patient's problems. In light of the above-noted issues, researchers have begun shifting their attention to specific transdiagnostic mechanisms of intervention (Barlow, Allen, & Choate, 2016; Barlow et al., 2017; Leichsenring & Steinert, 2018; Lundahl, Kumz, Brownell, Tollefson, & Burke, 2010) and/or the integration of transtheoretical techniques into coherent, person-centered models (Bagby et al., 2016; Cain & Pincus, 2016; Cohen & DeRubeis, 2018, Fisher, 2015). These worthwhile goals notwithstanding, we remain hopeful that a better understanding of

individual differences in psychopathology can lead to a more prescriptive and evidence-based framework for targeted psychological intervention (Holmes et al., 2018). In this section we review three specific problems with the categorical model with respect to psychotherapy research and practice pertaining to a) the relations of different disorder concepts to one another ("comorbidity"), b) differences among people with the same diagnosis ("heterogeneity"), and c) the arrangement of disorders across different levels of abstraction ("structure").

Comorbidity

The concept of *comorbidity* refers to the co-occurrence of putatively distinct conditions in the same person. Following from the idea of each condition as a separate entity, the observed co-occurrence is presumed to be coincidental (non-systematic). For instance, a person could have shingles and gingivitis at the same time, but because of their distinctive etiologies these conditions would be treated by independent methods. Even allowing for the possibility that one condition could heighten the probability of another (e.g., because of the generalized impact of a compromised immune system), comorbidity should be relatively rare if it is purely random (i.e., joint prevalence should reflect the product of individual prevalences). Yet in psychiatry comorbidity is the rule rather than the exception (Brown et al., 2001; Regier et al., 2009). Statistical evidence suggests that this is because different disorder categories have substantially overlapping liabilities (e.g., depression and anxiety share an internalizing liability; Brown & Barlow, 2009; Kotov, 2017; Krueger et al., 2014). The practical impact is that, whereas the goal of diagnosis is to identify the disorder that is causing the patient's problems, most patients present with "multiple disorders". Consequently, the hope of matching a single treatment to the most important or explanatory disorder (or matching different treatments to ostensibly different comorbid disorders) is challenging. Extensive comorbidity complicates sampling for RCTs,

because the researcher either has to select a patient population that is so specific as to be rare in actual practice (if the selection criteria is meeting a single diagnosis and no others) or so diverse that the interpretability of findings is imprecise (if multiple diagnoses are allowed) (e.g., Zimmerman, Chelminski, & Posternak, 2005).

Heterogeneity

As problematic as comorbidity is for interpreting findings from psychopathology and treatment studies, a categorical and polythetic approach to diagnosis complicates matters further by producing substantial *heterogeneity* among people assigned the same diagnosis. For example, there are nine criteria for borderline personality disorder (PD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM, American Psychiatric Association, 2013); five are required for a diagnosis. Thus, two people with this diagnosis could have one common and four non-common symptoms (some disorders, like obsessive compulsive PD, only require half of the criteria, meaning two patients with the same diagnosis could share *no* symptoms). Moreover, 256 unique constellations of the nine diagnostic criteria could yield the same borderline diagnosis. Subgroups of individuals with borderline PD diagnoses can be empirically distinguished according to their positions on a small set of evidence-based dimensions (e.g., Wright et al., 2013; 2016). Should the same treatment be expected to be similarly effective for two people with the "same diagnosis" but different symptoms and presentations? Diagnostic heterogeneity compels the clinician to go beyond the assigned diagnosis and generate individual-level formulations that are not codified in the diagnostic scheme (see a compelling example for depression from Fried, 2017). Although this is perhaps unavoidable given the current state of knowledge, it also reflects a defect in contemporary diagnostic constructs in that a single

categorical diagnosis often lacks sufficient information to determine the most effective intervention in individual cases (Krueger & Eaton, 2010).

Structure

Heterogeneity reflects a problem with a single diagnosis whereas comorbidity reflects problems with sets of diagnoses. Both of these problems can be understood as aspects of a more general issue involving the network of interrelations among different forms of psychopathology and their characteristic symptoms. The DSM and International Classification of Diseases (ICD; World Health Organization, 2015) organizes different groups of disorders into chapters based on their presumed phenotypic similarity (e.g., involvement of substances, dysregulation of mood). Disorders in turn have certain sets of symptoms, sometimes further arranged via subtypes and specifiers. There is some clinical value in distinguishing these levels of abstraction (i.e., symptoms, disorders, disorder groupings). For instance, this organization can guide an efficient yet comprehensive approach to assessment (Bagby et al., 2016) and is potentially useful for treatment researchers interested in determining the level (e.g., symptom versus disorder) at which a particular intervention seems to be operating (e.g., Barlow et al., 2016; Conway et al., under review). However, this hierarchical organization is limited because it is not rooted in systematic empirical evidence, but rather in some mix of clinical authority and historical tradition (Decker, 2013; Zachar, Krueger, & Kendler, 2016). The result is a structure of chapter-groupings, disorders, and symptoms that do not appear to map onto how these phenotypes are empirically organized. The tenuous correspondence between the organization of psychopathology as specified in the DSM/ICD and what we know about its structure based on empirical research poses a serious impediment to psychotherapy practice and research. As a basis for addressing this, we next discuss an evidence-based model for characterizing

psychopathological symptoms and conditions that could provide for a more clinically useful description of individual patients and a more precise determination of treatment targets.

The Hierarchical Taxonomy of Psychopathology

An evidence-based alternative that can address the shortcomings of a categorical nosology has emerged from the psychological study of individual differences (Krueger et al., 2014). This field, which has produced a large body of research on the empirical structure of mental disorders, serves in turn as a foundation for the *Hierarchical Taxonomy of Psychopathology* (HiTOP; Kotov et al., 2017), a model for diagnostic classification advanced by an international consortium of researchers committed to aligning clinical research and practice with extant quantitative evidence regarding the structure of mental health problems (https://medicine.stonybrookmedicine.edu/HITOP).

Although the two frameworks share many of the same constructs, the essential difference between the HiTOP and categorical models lies in how they organize psychopathology. HiTOP is an evidence-based model that relies on existing empirical evidence from quantitative research studies, in contrast to categorical models emphasize expertise/authority, clinical impression, and historical tradition (e.g., Kotov et al., 2011; Wright et al., 2013). This leads to two additional and more specific differences - one at the level of individual variables and one at the level of interrelations among variables. With respect to individual variables, because available evidence favors continuous to categorical models of mental disorder (Markon, Chmielewski, & Miller, 2011; Haslam, Holland, & Kuppens, 2012), HiTOP conceptualizes psychopathology as continuously distributed rather than as binary categories. With respect to the interrelations among variables, HiTOP groups psychopathology constructs based on their empirical relations to one another in a hierarchical factor structure (Figure 1; Kotov et al., 2017), whereas expert-based

models organize psychopathology constructs based on their presumed phenotypic similarity. Given that evidence is incomplete regarding the structure of psychopathology, particularly at the lower levels of the hierarchy, the HiTOP structure is an evolving model undergoing continuous empirical refinement.

At the top of the hierarchy is a general psychopathology factor which reflects nonspecific clinical severity and results from the positive covariance of all forms of psychopathology (Caspi et al., 2014; Caspi & Moffitt, in press; Hopwood et al., 2011; Lahey et al., 2012; Murray, Booth, Eisner, Obsuth, & Ribeaud, in press; Oltmanns, Smith, Oltmanns, & Widiger, in press; Wright et al., 2012). HiTOP characterizes such a factor explicitly, whereas it is absent in the DSM.[1] The next level are major spectra, including internalizing, thought disorder, disinhibited externalizing, antagonistic externalizing, detachment, and somatoform (Kotov et al., 2017). These spectra resemble individual difference dimensions identified in basic personality research and capture a level of generality analogous to the chapters of the DSM or ICD (Krueger & Markon, 2014).

Spectra have sub-factors that describe major groupings of diagnostic variables, such as fear and distress (Clark & Watson, 2006). Below these sub-factors are syndromes that are similar to DSM disorder categories (e.g., depression, alcohol misuse). Note that many of these syndromes are not strictly evidence-based in the sense that they often include multiple dimensions that may relate to different elements of the HiTOP model, although they do have the practical advantage of connecting HiTOP to existing diagnostic models such as the DSM. Below this level are homogeneous symptom components (e.g., insomnia) and narrow maladaptive traits (e.g., callousness). Finally, the lowest level of the hierarchy includes specific signs (e.g., loss of

[1] One could argue that the DSM-IV GAF (APA, 2000) or the DSM-5 Alternative Model of Personality Disorders Levels of Personality Functioning Scale (APA, 2013) reflect this variable; neither of these variables are part of the official DSM-5 classification framework. The ICD has recently introduced a severity dimension for personality disorder diagnosis that is similar to the general factor of psychopathology.

appetite), symptoms (e.g., self-damaging impulsivity), and maladaptive behaviors (e.g., compulsive checking).

This empirical organization promotes an efficient and clinically useful understanding of how different types of psychopathology relate to one another. For instance, the symptom of intense sadness is understood as an aspect of the more general construct of depression, which is one of several syndromes within a distress sub-factor, which in turn represents one of two internalizing dimensions. The organizational scheme makes it explicit that other variants of distress, such as post-traumatic stress or generalized anxiety, are inherently related to depression. Social phobia symptoms are also related to depression but the connection is somewhat weaker. This distinction is captured by the placement of social phobia into a fear sub-spectrum, while assigning both depression and social phobia to the internalizing spectrum reflects the commonalities. Dishonesty would be considered part of an antisocial syndrome within the antagonistic externalizing spectrum, and thus would be distinguished from both social phobia and depression at the level of internalizing vs. externalizing spectra.

Within this evidence-based structure, comorbidity is understood as a natural consequence of the fact that different syndromes or symptoms overlap in terms of phenomenology. For instance, depression and social phobia would be expected to correlate more strongly with one another than either would correlate with dishonesty because they are both part of an internalizing spectrum. Heterogeneity is addressed by identifying tightly-knit traits and symptom components (e.g., depression harbors distinguishable physiologic and cognitive components).

The potential advantages of HiTOP for diagnostic practice were recently reviewed by Ruggero et al. (under review). That paper focuses on general issues involved in the translation of HiTOP to clinical practice, such as diagnosis, instrument selection, and billing. In this

complementary paper, we focus on specific potential advantages of HiTOP for psychotherapy research and practice.

HiTOP and Psychotherapy

As an evidence-based model, HiTOP is theoretically agnostic, and as such, can be helpful to clinicians and researchers practicing from different treatment perspectives. We also think that HiTOP, which is firmly rooted in psychopathology research, can learn from psychotherapists and psychotherapy researchers about the best ways to enhance its clinical utility. Thus, the purpose of this section is to consider how the HiTOP model might be expanded toward the development of transtheoretical therapy principles and, ultimately, a more clinically useful diagnostic scheme. This work is concordant with a number of other manuscripts linking psychotherapy to evidence-based models of psychopathology (Anchin & Pincus, 2010; Bagby et al., 2016; Barlow et al., 2016, Beutler & Clarkin, 2013; Castonguay & Beutler, 2006; Hopwood, 2018; Livesley, Dimaggio, & Clarkin, 2016; Millon & Grossman, 2007; Roberts et al., 2017; Singer, 2005; Widiger & Presnall, 2013).

For ease of presentation, we focus on individual psychotherapy for adults and summarize therapy techniques into three broad clusters (Hopwood, 2018). The first is *common factors*, or techniques thought to be helpful across different therapeutic approaches. Common factors include expectancy effects, a coherent and agreed-upon plan, the therapist’s warmth, empathy, and genuine concern for the patient. The second and third clusters each comprise techniques specified by their underlying theoretical models (see Blagys & Hilsenroth, 2000, 2002). *Cognitive-behavioral techniques* tend to be justified based on learning theory and the psychotherapist’s role is generally understood as relatively didactic and Socratic. Cognitive-behavioral techniques include psychoeducation, skills training, relaxation or mindfulness

strategies, differential reinforcement, behavioral activation, exposure and response prevention, and cognitive restructuring. In contrast, *relational techniques* are rooted in psychodynamic theories, which conceptualize psychotherapy in terms of intersubjective dynamics between therapist and patient. Strategies in this category include technical neutrality, the interpretation of transference and resistance, the therapeutic use of countertransference, and the promotion of mentalizing. We acknowledge that the overlap, heterogeneity, and tenuous empirical structure of this model is subject to the same criticisms that we level against categorical models of psychopathology. Unfortunately, evidence-based schemes are not as well-developed for the delineation of different forms of psychotherapy as they are for demarcating psychopathology constructs. Dividing psychotherapy into these three groups is imperfect but sufficient to describe how major classes of intervention may map onto individual differences in psychopathology from a HiTOP perspective.

It is tempting to try to map the specific techniques of each of these clusters onto one or more variables in the HiTOP model. We do not take this approach for two reasons. First, there is insufficient evidence at this time for constructing such a map with confidence. Second, many techniques are likely to be effective for a range of different problems, which may help explain why many clinicians blend techniques from each of these groupings, depending on their own preferences and their perceptions of the patient's needs (Rihacek & Roubal, 2017). HiTOP does not make strong assumptions about which level is most important for a given patient's presentation or treatment plan. Instead, the hierarchical level at which an intervention will work is considered an empirical question (Conway et al., under review). This perspective can be contrasted with RCTs that match treatment packages to specific disorder categories. As such, we focus here on the clusters of techniques as whole, in an effort to answer three questions about

each cluster. First, what areas of complementarity exist between each class of techniques and the HiTOP model? Second, what can HiTOP offer each class of techniques? Third, what can each class of psychotherapy techniques offer HiTOP?

HiTOP and Common Factors

One of the more robust findings in the psychotherapy literature is the wide-ranging influence of common factors, or features of psychotherapy that transcend theoretical orientation in promoting durable patient improvement (Wampold, 2015). This mirrors the robust finding in the psychopathology literature that different problems tend to correlate positively. Both of these findings appear at odds with the tendency of researchers to focus on the differences between disorders and treatment approaches. Instead, the presence of transtheoretical common factors in psychotherapy and a statistical general factor psychopathology should support integrative approaches to practice and research. That is, psychopathology and psychotherapy researchers should focus more on clarifying why so many different problems seem to co-occur, and why so many features of psychotherapy seem to be effective for treating people regardless of their specific problems (Wachtel, 2018).

In addition, research aimed at ascertaining the degree to which general factors in psychopathology and psychotherapy have something in common would be useful. For instance, it could be the case that common psychotherapy factors reduce specific symptoms *through* their impact on the general factor of psychopathology. For instance, a strong therapeutic alliance paired with a collaborative treatment plan may also relieve the general sense of demoralization that tends to occur across most variants of psychopathology, and thereby account for a sizeable proportion of treatment gains. Or, expectancy effects on the part of both therapist and patient or which are shared or emergent within the dyad may increase hope and thus reduce general

distress. Although more work needs to be done to understand the nature of the general psychopathology factor, an evidence-based articulation of its elements, such as is provided by HiTOP, might provide an explanation for why different treatment approaches tend to produce similar therapeutic effects.

These possibilities highlight the types of novel insights the HiTOP model can offer psychotherapy research and practice. Conversely, progress in articulating the common factors of psychotherapy could be useful for developing a better understanding of why different aspects of psychopathology are related to one another. More empirical attention has been given to the issue of common factors in psychotherapy research than to the idea of a general factor in psychopathology research, and thus the features of common psychotherapy factors are fairly well-delineated (Norcross, 2002; Wampold, 2015). In contrast, current understanding of the general factor of psychopathology is mostly statistical. A transtheoretical conceptual understanding of this construct (e.g., its etiology) are relatively less developed (although see Caligor et al., 2018; Caspi et al., 2014; Kernberg, 1984). Synthesizing these two streams of research will likely enhance our understanding of both psychopathology and psychotherapy.

HiTOP and Cognitive-Behavioral Treatments

One of the reasons for the ascendance of cognitive-behavioral therapy (CBT[2]) has been its wide adoption in psychotherapy research, particularly as conducted by psychologists. The general approach in this research has been to use measures that correspond to categorical disorders as selection and outcome variables, and then apply the RCT method to evaluate treatment efficacy. This research has yielded notables successes but puts CBT, which has historically emphasized the importance of empirical evidence as a therapeutic technique (e.g., in

[2] This term includes behavioral and "third-wave" cousins of standard CBT.

the promotion of balanced thoughts) and in promoting the general approach, in a somewhat awkward position as limitations of the categorical model conceptualization of mental illness have become increasingly apparent. The field's recent emphasis on transdiagnostic practice (e.g., Barlow et al., 2016; Lang et al., 2012; Neacsiu et al., 2014; Sauer-Zavala, Bentley, & Wilner, 2016) is corrective in this regard. However, thus far this work has focused primarily on regions of the HiTOP hierarchy focused on internalizing, and thus could be fruitfully expanded to cover a wider range of psychopathology from a HiTOP perspective (e.g., antagonism or detachment; c.f., Hopwood & Krueger, 2016).

Thus, the HiTOP model can offer a framework for moving this emerging transdiagnostic approach further toward the application of CBT to all forms of psychopathology within an integrated framework. HiTOP shares the cognitive-behavioral emphasis on prioritizing evidence over clinical impression or intuition and efficiently assessing (and treating) psychopathology. These shared values provide considerable room for integrating the HiTOP approach into CBT practice and research, which should be appealing to CBT practitioners and researchers insofar as the HiTOP scheme offers a more parsimonious and valid assessment model than is offered by categorical models. HiTOP also includes narrower dimensions that have played a central role in CBT formulations (Smith, McCarthy, & Zapolski, 2009), but which are missing or blurry in categorical models, such as the distinction between performance and interactive anxiety within the social anxiety category or between checking, cleaning, and rituals within obsessive-compulsive psychopathology.

In return, the HiTOP model has much to gain from interfacing with cognitive behavioral practice and theory. Built primarily on statistical analyses of cross-sectional psychopathology data, HiTOP does little to articulate the mediating affective and cognitive processes that give rise

to dysfunctional behavior, although there is an emerging body of research on temporal dynamics in psychopathology dimensions (e.g., Wright et al., 2015; 2016) and how those dynamics can be leveraged in psychotherapy (e.g., Wright et al., 2014). In contrast, understanding the meaning and function of dynamic processes has been a major focus of research devoted to dismantling the processes by which CBT exerts its effects (e.g., Arch et al., 2012; Pompoli et al., 2018). Similarly, weaving principles of learning into clinical phenomena at different levels of the HiTOP model would be advantageous for understanding environmental influences on the expression of psychopathology. HiTOP is likewise mostly uninformative at this time regarding how to distinguish stable traits from dynamic states insofar as supportive evidence has been primarily cross-sectional (although, see Zimmermann et al., in press). But this represents a major focus of treatments in the CBT tradition. An articulation of these factors, as could be provided by CBT theory and research, would add considerable explanatory flesh to the phenotypic bones of the HiTOP model, and thereby enhance its clinical utility.

HiTOP and Relational Treatments

HiTOP shares with the relational approach to therapy an emphasis on the whole person and the complex multidimensionality of problems in living. Both of these approaches counter the reductionist impulse that sometimes characterizes psychiatric, biological, and cognitive-behavioral approaches to understanding psychopathology and treatment. This emphasis on the whole person provides a strong foundation for integrating HiTOP into relational practice and research. Moreover, major models of psychopathology that feature a relational perspective have traditionally focused on dimensional constructs (e.g., Luyten et al., 2014). However, an historical limitation of relational theories has been the lack of a consensual, evidence-based scheme for delineating the different components of personality and psychopathology. Although some

progress has been made on this front recently (e.g., Lingiardi et al., 2015; Zimmermann et al., 2012), an integration of this work with HiTOP would be of significant benefit to the field. In particular, the ability of HiTOP to summarize the complexity of a person's problems in a way that is parsimonious, focused, and more readily relatable to etiology research would be valuable to integrate with practice guidelines grounded in relational therapies.

The HiTOP framework also stands to benefit from connecting with elements of the relational perspective. Given its psychodynamic origins, relational clinicians tend to stress distinctions between more versus less conscious aspects of personality and psychopathology (Epstein, 1994; Westen, 1998). Such factors have not been integrated with HiTOP as of yet, but they may have important implications for assessment and treatment. For example, the HiTOP tradition is based primarily on work with verbal report-based measures (questionnaires and interviews) that rely primarily on conscious knowledge on the part of respondents, and which might be usefully supplemented by more performance-based measures (e.g., stimulus-attribution or lab-behavioral assessments). The psychodynamic origins of relational treatments also highlight the role of developmental processes (Fonagy, 2018; Greenspan, 1989), about which HiTOP is mostly agnostic. Finally, as the term "relational" implies, therapeutic approaches of this type emphasize how different features of personality and psychopathology occur in interactions between the self and others. Relational theories can therefore add to HiTOP a more nuanced consideration of how the social environment reinforces, maintains, or alters psychopathology (Caligor, Kernberg, Clarkin, & Yeomans, 2018; Pincus, Hopwood, & Wright, in press; Pincus & Wright, 2011).

HiTOP Principles for Psychotherapy Practice and Research

In this section we outline several specific principles for psychotherapy practice and research. These principles are based on the convergence of HiTOP with common factors, cognitive-behavioral, and relational psychotherapy approaches illustrated above.

Practice Principles

Clinical utility studies suggest that clinicians and researchers tend to find dimensional models more useful than categorical models (e.g., Morey, Skodol, & Oldham, 2014; Mullins-Sweatt & Lengel, 2012). However, such research has focused primarily on personality disorders. The hierarchical organization of psychopathology variables in HiTOP facilitates a comprehensive approach to assessment of both pre-treatment functioning/diagnosis and treatment outcomes for all of psychopathology. It follows that HiTOP-oriented clinicians would find it useful. The most direct and obvious application at this point involves assessment. In acute-care settings, where time for intake evaluation is limited, brief assessments of cardinal symptoms of the major spectra would allow for an initial conceptualization of problem symptoms. As time permits and treatment progresses, this would be followed by targeted assessments of specific problem components and traits identified in the initial screening assessment (Ruggero et al., in review).

A number of other evidence-based models of psychopathology and personality organize dimensions into a hierarchical structure. Measures designed to operationalize those models tend to fit comfortably within the HiTOP framework (e.g., Achenbach & Rescorla, 2001; Ben-Porath & Tellegen, 2008; Krueger et al., 2012; Morey, 1991; Simms et al., 2011; Watson et al., 2007), and the HiTOP consortium is currently working on the development of new measures explicitly tied to its hierarchical structure. In addition, an evolving set of web resources is available to

assist clinicians interested in using HiTOP to guide their assessment practice (https://psychology.unt.edu/hitop; Ruggero et al., in review).

The above-described assessment approach should help the clinician identify the specific regions of the HiTOP model that are most relevant to the patient's presenting problems. The flexibility of HiTOP allows the clinician to focus on different levels of generality (top to bottom in Figure 1) and type of problem (left to right in Figure 1). The clinician would then apply the intervention that is most likely to work, based on the HiTOP characterization of the client's clinical concerns. Of course, decisions regarding specific treatments of choice are only possible to the degree that evidence exists to support different treatments for different regions of the HiTOP space, which will ultimately be determined by ongoing research efforts. While RCTs will surely continue to have a place in treatment research, we envision a broader perspective and more diverse approach moving forward that can better align with the multidimensional nature of both psychopathology and psychotherapy (Fisher & Boswell, 2016; Hilsenroth, 2007; Kazdin & Blase, 2007; Roth & Fonagy, 2013).

To be clear, a clinician operating from a particular theoretical perspective, such as CBT or relational orientations, would likely consider other aspects of the presentation from that perspective. But doing so would require them to go beyond the DSM scheme and thus divorce diagnosis from conceptualization; we present HiTOP as a potential means of synthesizing diagnosis and conceptualization. To illustrate, we briefly speculate about how certain cognitive behavioral treatments may be differentially effective for different HiTOP spectra in order to give the reader a more specific idea of what we have in mind (see Chorpita & Daleiden, 2009 for a rich example of this kind of approach with respect to behavioral interventions for children and adolescents). As somatoform symptoms generally involve incorrect attributions about bodily

functioning coupled with maladaptive responses to those issues, techniques that involve interoceptive exposure and response prevention appear to be a natural match (Brown, 2004; Schandry & Weitkunat, 1990; Witthöft & Hiller, 2010). Similarly, internalizing problems often involve intense fear or self-critical thoughts coupled with maladaptive reactions, suggesting the viability of more general forms of exposure and response prevention and/or cognitive restructuring (Alden, Buhr, Robichaud, Trew, & Plascencia, 2018; Barlow et al., 2016). As psychotic symptoms involve a misinterpretation of reality, cognitive restructuring and behavioral experimentation would appear to fit well (Bouchard et al., 1996; Butler et al., 2006; Morrison, Renton, French, & Bentall, 2008). Antagonistic externalizing problems involve a failure to get along with others, suggesting the applicability of social skills training techniques, anger management, and reward-based techniques (Landenberger & Lipsey, 2005). Disinhibited externalizing captures the tendency to behave rashly without forethought, which might be treated with motivational techniques (Yakovenko et al., 2015), mindfulness practice (Garland et al., 2010), and interventions fostering increased conscientiousness (Roberts, Hill, & Davis, 2017). Finally, the withdrawal from social life that characterizes disorders of detachment might be responsive to behavioral activation strategies and perhaps group approaches (Ekers et al., 2014).

Ultimately, we anticipate the field moving towards a truly multidimensional, configural approach that accounts for interplay among clinical phenotypes. For instance, it is likely that internalizing and externalizing behaviors are linked within a given individual, such as when a person uses alcohol to cope with mood dysregulation, or conversely when alcohol use contributes to mood dysregulation. Although such within-person dynamics have not been a focus of the HiTOP consortium as of yet, establishing the general structure of psychopathology via the HiTOP model can facilitate clearer clinical conceptualizations and measurements of such

interactions and inform research that is pertinent to individual cases. In the next section, we describe in more general terms how HiTOP can contribute to clinically relevant psychotherapy research.

Research Principles

In the preceding section we described how HiTOP principles could be synthesized with major approaches to psychotherapy in order to enhance clinical practice. Our long-term hope is that HiTOP will ultimately promote more clinically useful models of psychotherapy research. With this in mind, we focus here on the differences between categorical and dimensional approaches such as HiTOP and benefits of the latter for treatment research.

The categorical model fosters a siloed approach to psychotherapy research, in which research groups, treatment studies, and outcome variables center on specific diagnoses. In contrast, HiTOP takes a more integrative stance because it makes no *a priori* assumptions about the level of the hierarchy at which a treatment might have its effects (Conway et al., under review). Recent trends in psychotherapy suggest that the relevance of treatment principles is more general than was initially assumed, insofar as common strategies are effective for a range of disorders (Barlow et al., 2016; Leichsenring & Steinert, 2018). This finding can be described, from a HiTOP perspective, as shifting the treatment focus up toward broader variables in the hierarchy (e.g., distress, rather than depression or posttraumatic stress disorder). As a general principle, a HiTOP-based researcher would not presuppose which level of the hierarchy a treatment is most likely to have impact, rather she would study this empirically.

Likewise, fewer *a priori* assumptions are made about the probable outcomes of any particular intervention. It is natural in an RCT of treatments for a particular diagnosis to focus on measured symptoms of that diagnosis as the primary or even only outcome variable. In contrast,

the HiTOP model views various mental health phenotypes as integrated within a more general framework of individual differences. From this perspective, it is more important to measure a range of outcome variables in treatment research beyond the symptoms of an index diagnosis. This broader approach can lead to a more integrated model of the impacts of interventions on distress and dysfunction.

A significant concern in the existing psychotherapy research literature has been the tendency for researchers with certain theoretical allegiances to study their preferred treatments, often finding that their treatments work best in their own studies. There is reliable evidence that allegiance and related factors influence these findings (Meichenbaum & Lilienfeld, 2018), and when studies from different research groups are combined meta-analytically, differences across orientation are generally very small and often not statistically significant (e.g., Barth et al., 2016; Wampold et al., 2016). This points to the potential value of integrating theoretical perspectives, a task that has been made difficult by historical factors. HiTOP may offer an avenue for therapeutic integration, insofar as it is agnostic about underlying etiological factors or theories of intervention. For instance, measures that align with HiTOP could be used to select patients and evaluate outcomes in treatment research, so that different interventions could be compared using common metrics and the impacts of treatment beyond the index diagnosis could be evaluated. In the end, we expect that empirical methods will be the most productive means for integrating diagnosis and practice and that clinicians and researchers who have no vested interests in showing one approach to be superior to another will welcome integrative clinical science and guidelines that considers all perspectives[3].

[3] The phrasing of the second half of this sentence was borrowed, with gratitude, from the comments of an anonymous reviewer.

Related to this point is the potential for HiTOP to be useful for studying how therapists, as opposed to therapies, impact treatment outcomes. For instance, it would be useful for future research to identify zones of the HiTOP space where certain therapists are likely to be most successful. Indeed, given its connection to general models of individual differences, the HiTOP system could be used to profile the strengths and weaknesses of therapists as well as patients.

In the beginning of this paper, we suggested that the RCT, filtered through the medical model, relies on the assumption that both categorical diagnoses and their treatments are meaningfully distinct. Our focus here, in line with HiTOP, is on improving methods for classifying diagnoses from a dimensional perspective. The current paper also provides an example of a new, HiTOP-oriented approach to classifying treatments involving specification of an empirical structure of psychotherapy techniques based on the similarity of their features and the psychopathology dimensions they target, as opposed to the particular theories they came from. Proceeding in this way would be valuable because distinguishing these features quantitatively in a manner analogous to HiTOP has the potential to significantly enhance psychotherapy research. That is, the structure of different types of treatment could be examined quantitatively to derive an evidence-based hierarchy of treatment techniques, which could then be applied to psychotherapy research in order to both integrate and distinguish different approaches. This would provide a more empirically-based approach to conceptualizing psychotherapy, as an alternative to simply assuming that techniques differ because they derive from different theoretical perspectives and appear in different treatment packages (see, e.g., Jones & Pulos, 1993.

Case Example

To conclude, we illustrate the conceptualization and psychotherapy of a case to concretize the potential advantages of HiTOP diagnosis relative to a categorical model. We borrow a case described as "Dennis" in Oltmanns, Martin, Neale, and Davidson (2015; Chapter 7). Dennis was an adult white male insurance salesman with diagnoses of panic disorder with agoraphobia and generalized anxiety disorder. Although he was a dispositionally social person, he had developed a fear of being embarrassed by a panic attack and as a result he avoided social situations. This avoidance contributed to a divorce and presented a challenge in maintaining a social support network. Dennis lived with chronic feelings of physical tension, often worrying if he would be successful in his sales and if he would be liked prior to meeting with prospective clients. He also experienced some gastrointestinal (GI) symptoms that were likely exacerbated by his anxiety but also increased the potential for social humiliation. He engaged in a variety of compensatory behaviors that interfered with his work efficiency, such as giving himself extensive pep talks prior to a sale and only driving on the right side of multilane roads out of fear of causing an accident in the case of a panic attack. His treatment was complicated by his self-consciousness and reticence about acknowledging or discussing the extent and nature of his problems. This included pretending not to be a patient at his therapist's office, which went so far in one instance of acting publicly as if he was treating his therapist rather than the other way around.

Diagnosis

From a HiTOP perspective, Dennis's categorical diagnoses would only tell part of the story. First, rather than conceptualizing these disorders as comorbid, they would be understood as two aspects of the same internalizing predisposition. From a HiTOP perspective, we should not be surprised that a person who experiences panic attacks also experiences generalized

anxiety as well as other features of fear and distress. Second, HiTOP embeds the primary symptoms into the overall clinical picture by including Dennis's somatoform and social difficulties. These features distinguish Dennis from other individuals with the same categorical diagnoses, thus reflecting the heterogeneity among anxious people. Articulating this heterogeneity is clinically important because these features interdigitate with his anxiety in important ways and suggest possible modifications to the treatment approach. His GI symptoms cause him anxiety and thus represent an important focus for treatment, as well as the need to coordinate with a GI specialist. The combination of his strong need for social connection with his fear about social embarrassment causes significant distress and interferes with the treatment relationship. These clinically important features are not captured by the categorical diagnoses of panic disorder, agoraphobia, and generalized anxiety disorder, but they are clearly depicted by HiTOP (Figure 2).

The hierarchical model further delineates the breadth of these problems from general propensities to specific manifestations, and specifies various levels of abstraction in between (Figure 2). This hierarchical depiction of his problems will help focus the clinician in terms of what to assess and where to intervene. For instance, an initial step might be to evaluate the HiTOP spectra. Observing high scores in internalizing and somatic complaints and very low scores on detachment (which can be understood as a high score on the personality dimension extraversion), the clinician might then drill down to examine specific aspects of functioning in each of those domains. In Dennis's case, the features at the middle level of the hierarchy include his panic attacks, agoraphobia, generalized anxiety, GI issues, and strong need for social approval and engagement. Having articulated these specific features and behavioral manifestations of each as articulated at the lower levels of the hierarchy (Figure 2), the clinician

is in a better position to develop hypotheses about functional relations between all presenting features and to develop a comprehensive and coherent treatment plan.

Cognitive-Behavioral Treatment

Several cognitive behavioral strategies are effective for treating panic symptoms, including psychoeducation, relaxation techniques, interoceptive exposure , and cognitive restructuring (Otto & Deveney, 2005). At the level of the individual case, the CBT therapist would generally use questionnaire or interview methods to assess the severity of each of the patient's presenting problems and then conduct a functional assessment to fill in the gaps left by the descriptive diagnosis (Persons, 2012). In Dennis's case, for instance, his first panic attack contributed largely to his agoraphobic behavior and in part to his generalized anxiety, which were both secondary to his fear of having another panic attack. This formulation would lead to the CBT hypothesis that focusing on the panic symptoms via exposure techniques should alleviate other problems. However, given the intensity of anxiety, the CBT clinician might begin with educational and relaxation techniques, and may wish to supplement with cognitive interventions regarding the interpretation of social behaviors along the way.

Compelling clinicians to screen for a broad range of issues up front is one way that HiTOP could enhance standard CBT practice. The measures most commonly recommended and used for CBT assessment do not focus on somatic complaints or extraverted personality style (e.g., Beidas et al., 2015). However, these features were clearly important in Dennis's case. His GI symptoms had a separate etiology that nevertheless became intertwined in his anxiety problems because his fear of public flatulence became another reason to avoid public situations, and his tension likely worsened his GI functioning. These GI symptoms would likely represent an important focus of exposure treatment, along with other (e.g., social) stimuli. Dennis's

awkward social behavior could be understood as a contradiction between his high need for social engagement (i.e., extraversion, or low detachment) coupled with his fear of humiliation in social situations. The potential conflict would be readily apparent to the CBT clinician who collected data both on his level of extraversion and social anxiety, as would be encouraged by the HiTOP model but not a categorical diagnostic scheme or standard CBT practice. Cognitive restructuring of his beliefs about his social presentation and attributions about social events could help resolve this conflict and help him be less ashamed and more socially comfortable. This, in turn, could reduce his avoidance of social situations.

Relational Treatment

There are also validated relational treatments for panic symptoms (Milrod et al., 2007). Relational approaches would generally emphasize the context in which panic occurs, both in terms of developmental factors and proximal situations, and the meaning attributed to the symptoms by the patient. They would use the therapeutic relationship to provide a secure environment for understanding this meaning and helping a patient like Dennis overcome his fears and stop avoiding threat-provoking situations, which would be interpreted as defensive behavior. The relational clinician might focus on Dennis's inner conflict between a strong impulse toward social engagement and an underlying fear of interpersonal failure. This would help make sense of the significant anxiety associated with social situations and would understand his highly contrived social behavior (e.g., his techniques for driving or preparing for a sale, or his performance in the waiting room) as a defensive maneuver about which he experiences intense shame and has a diminished capacity for reflection. The availability of an empathic and holding therapeutic relationship could help him cut through the shame, see both sides of this conflict

more clearly, and tolerate the negative emotions that come with social behavior so that he can comport himself more adaptively.

It is less common in relational practice to use standardized symptom assessments, perhaps in part because of the perception that instruments targeting categorical disorders do not capture the range of features relevant to a relational formulation (McWilliams, 2011). An advantage of HiTOP is that it would cover many of the elements necessary to make a relational formulation. Unlike a categorical diagnosis focusing on panic, agoraphobia, and generalized anxiety, HiTOP would depict all of the major elements of a relational formulation, including the conflict between his heightened need for social acceptance (low detachment) coupled with his social fear (social anxiety) as well as some of the symptoms/defenses that result (panic, somatic issues, avoidance, and contrived social behavior). From a psychodynamic perspective, capacity for reflection might be indicated by his standing on the general psychopathology factor (Kernberg, 1976). In Dennis's case, this would probably be moderate, insofar as he is functional in many areas and his capacity to reflect seems to be restricted to one domain, albeit an important one (Caligor, Kernberg, & Clarkin, 2007). This would suggest his potential to benefit from a relatively expressive form of treatment (Caligor et al., 2018).

Conclusion

In an ideal world, clinicians could draw relatively direct lines from diagnosis to treatment. Determining these lines is the goal of the RCT method of psychotherapy outcome research. As it stands, however, clinicians from different perspectives who have established a categorical diagnosis are still left with a lot of work to do for developing a clinically useful formulation. HiTOP, as a descriptive and nomothetic model of psychopathology phenotypes, does not close this gap entirely. The CBT clinician still needs to generate and test hypotheses

about the functional relationships among different elements that would provide a framework for determining how to stage different interventions. The relational clinician needs to evaluate the patient's capacity for reflection, identify the central impulses, defenses, conflicts, and interpersonal themes, and establish an interpersonal stance that will be most likely to contribute to therapeutic improvement. But in both cases, HiTOP offers a more comprehensive assessment and thereby provides more of the descriptive information that the clinician would need to develop a clinically useful formulation.

Summary

Evidence based models of psychopathology such as HiTOP are poised to revolutionize the field's understanding of the structure of mental disorder and reshape how diagnostic assessments are performed and utilized. This revolution has the potential to profoundly impact treatment. At a general level, HiTOP helps explain otherwise vexing issues like comorbidity and heterogeneity and connects psychiatric diagnosis to models of individual differences that are more commonly used in basic science (Conway et al., under review; Ruggero et al., under review). More specific to psychotherapy, it provides a theoretically neutral language that can help facilitate the integration of ideas about intervention that stem from different theoretical traditions.

That said, there are a number of barriers to implementing the HiTOP clinically and to using a scheme such as HiTOP to improve psychotherapy practice and research. These include traditional divisions between different schools of psychotherapy, the deep embeddedness of the categorical model in health care systems and third-party reimbursement, and a more general and understandable resistance to change. One of the goals of the HiTOP consortium is to help overcome such obstacles in order to facilitate the transition to a more evidence-based and

clinically-useful model of psychopathology. In this paper, we have contrasted HiTOP with the categorical model with specific reference to psychotherapy and emphasized potential connections between HiTOP and major approaches to intervention. In addition, we have highlighted major advantages of the HiTOP model and offered concrete suggestions as to how the HiTOP framework could be integrated into current psychotherapy practice and research.

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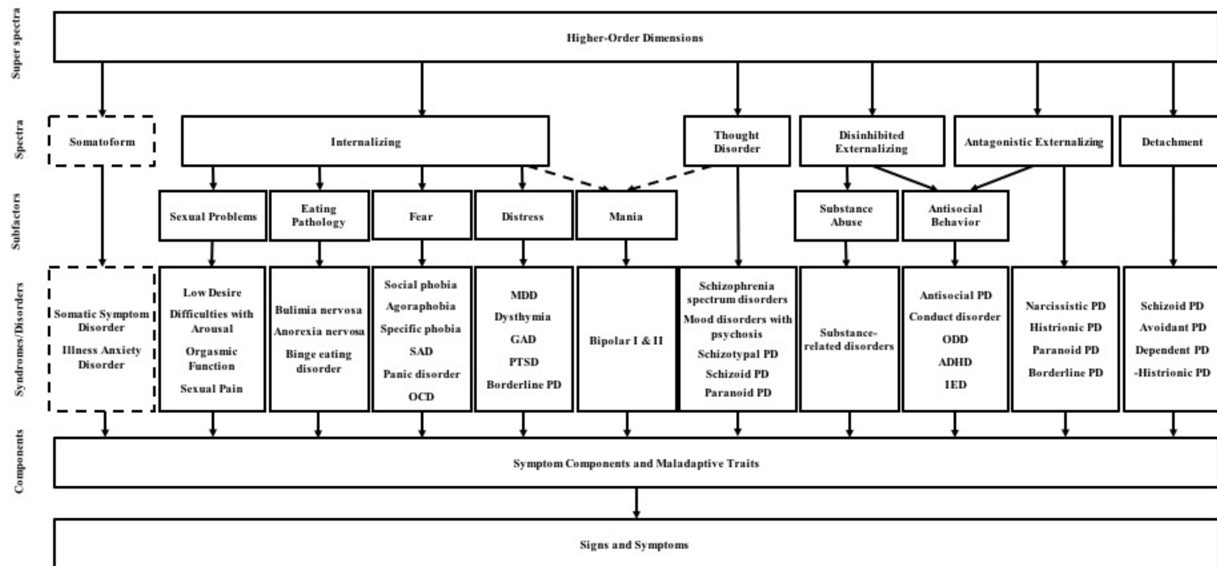
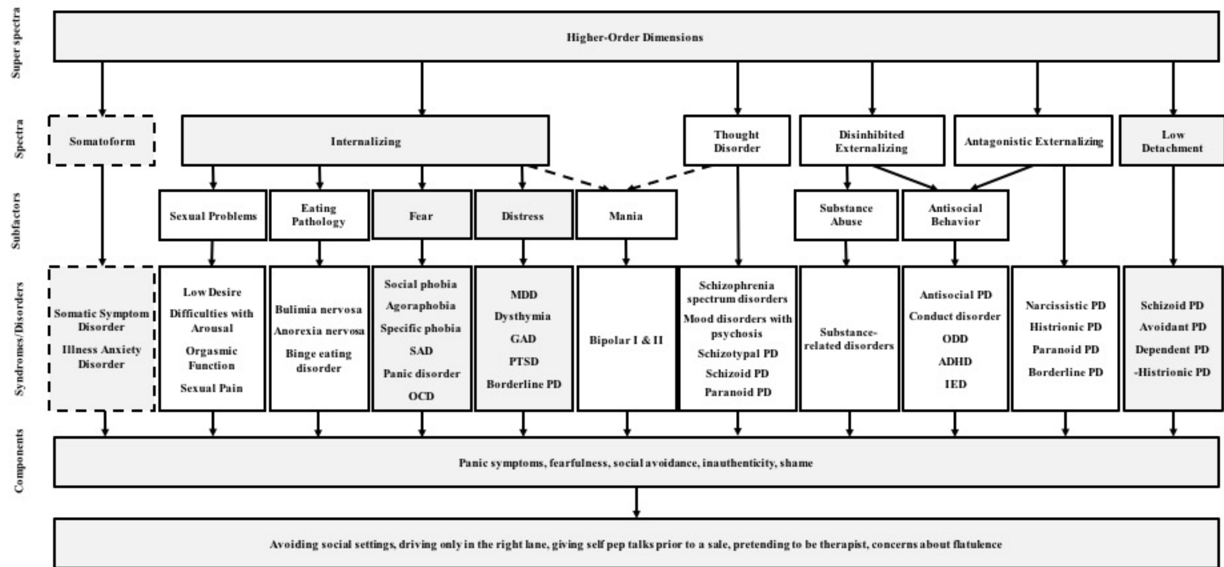
Figure 1. *Hierarchical Taxonomy of Psychopathology.*



Note. Adapted from Kotov et al. (2017).

Figure 2. HiTOP *diagnosis of Dennis.*



Note. Adapted from Kotov et al. (2017). Shaded elements reflect clinically significant features for Dennis.