INTRODUCTION

Transdiagnostic Approaches to Mental Health Problems: Current Status and Future Directions

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Despite a longstanding and widespread influence of the diagnostic approach to mental ill health, there is an emerging and growing consensus that such psychiatric nosologies may no longer be fit for purpose in research and clinical practice. In their place, there is gathering support for a "transdiagnostic" approach that cuts across traditional diagnostic boundaries or, more radically, sets them aside altogether, to provide novel insights into how we might understand mental health difficulties. Removing the distinctions between proposed psychiatric taxa at the level of classification opens up new ways of classifying mental health problems, suggests alternative conceptualizations of the processes implicated in mental health, and provides a platform for novel ways of thinking about onset, maintenance, and clinical treatment and recovery from experiences of disabling mental distress. In this Introduction to a Special Section on *Transdiagnostic Approaches to Psychopathology*, we provide a narrative review of the transdiagnostic literature in order to situate the Special Section articles in context. We begin with a brief history of the diagnostic approach and outline several challenges it currently faces that arguably limit its applicability in current mental health science and practice. We then review several recent transdiagnostic approaches to classification, biopsychosocial processes, and clinical interventions, highlighting promising novel developments. Finally, we present some key challenges facing transdiagnostic science and make suggestions for a way forward.

What is the public health significance of this article?
Traditional diagnostic systems may no longer be fit for purpose for classifying mental ill health, facilitating understanding of its core underlying biopsychosocial processes, nor driving clinical developments. Here we propose that 'transdiagnostic' approaches have the potential to better represent the clinical and scientific reality of mental health problems, reflecting the complexity, dimensionality and comorbidity that is the norm in clinical practice.

Keywords: transdiagnostic, mental health, classification, biopsychosocial processes, clinical interventions

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Distress and suffering are an existential cornerstone of the human condition, yet how we reflect upon and describe the extremes of our mental duress has varied enormously across history. For more than 100 years, certainly in the West, the predominant means of conceptualizing mental health struggles has been to categorize them within formal taxonomic systems (Kendler, 2009), organized according to hypothetical distinctions between different sets of signs and symptoms, and compiled into comprehensive compendia of psychiatric diagnoses. The current leading such taxonomies—the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; now in its 5th edition) and the International Classification of Diseases (ICD; now in its 11th edition)—are long-established, have global reach, and exert a profound influence over the ways in which we understand, assess, and manage mental ill health.

Despite the historical momentum and widespread influence of the diagnostic rubric, there is an emerging and growing consensus that such psychiatric nosologies may be reaching the limits of their research and clinical utility. In their place, there is gathering support for a "transdiagnostic" approach that cuts across the traditional diagnostic boundaries or, more radically, sets them aside altogether, to provide novel insights into how we might understand mental health difficulties. This transdiagnostic approach extends beyond issues of taxonomy. Removing the distinctions between proposed psychiatric taxa at the level of classification opens up new ways of conceptualizing the underlying theories and processes implicated in mental ill health and provides a platform for novel ways of thinking about onset, maintenance, and clinical treatment and recovery from experiences of disabling mental distress.

The transdiagnostic field is nascent yet fast-developing. This Special Section of the *Journal of Consulting and Clinical Psychology* provides a timely opportunity to take stock of the current state of transdiagnostic science. In this introduction we review where the field has come from and where it is heading, highlighting issues that require some resolution and offering recommendations for progress.

Diagnostic and Transdiagnostic Approaches

Although attempts to classify mental health difficulties date back several thousand years, formalized diagnostic models only emerged properly from the biological and Linnaen botanical classification systems of the 19th century. Most prominently, Kraepelin's *Compendium der Psychiatrie* in 1883 (Compton & Guze, 1995) exerted a profound influence on the development of the emerging field of clinical psychiatry especially in the United States, laying the foundation for the publication of the first edition of the *DSM* in 1952 (*DSM-I*, American Psychiatric Association, 1952). In 1980, the publication of the *DSM–III* outlined for the first time a thorough multiaxial diagnostic system with carefully operationalized criteria for a wide range of disorders, with no allegiance to any theoretical approach aside from a broad biomedical model. The *DSM–III* was hailed as a "paradigm shift" (Blashfield, Keeley, Flanagan, & Miles, 2014) for diagnostic psychiatry, rescuing the profession ". . . from unreliability and the oblivion of irrelevancy" (Frances, 2009, p. 2). The current instantiation of the *DSM*—the *DSM–5* – appeared in 2013 after a 14 year gestation and runs to 947 pages covering some 541 diagnostic categories (up from 106 in the *DSM-I*; American Psychiatric Association, 2013).

The *DSM* and ICD have evolved into self-perpetuating systems that now govern and define all aspects of how we conceptualize mental health. They provide an organizing framework for virtually all core texts in psychiatry, clinical psychology, and abnormal psychology (Cosgrove, Krimsky, Vijayaraghavan, & Schneider, 2006; Marecek & Hare-Mustin, 2009), they guide mental health training across the helping professions, and they define how we assess, manage and treat mental health problems worldwide. The diagnostic systems that they enshrine have created a form of "epistemic prison" (Hyman, 2010) that constrains health insurance and pharmaceutical industry practices, is sanctioned and supported by government and legal policies, and dominates social and public discourse about mental health and illness, as reflected in art, literature and the visual media (Ussher, 2010).

There are many factors underscoring this rise to dominance. Some are certainly sociopolitical (Kawa & Giordano, 2012; Khoury, Langer, & Pagnini, 2014) with diagnoses offering a biomedical legitimacy to discourse about mental ill health that has a broad academic, professional, and social appeal. Others are more pragmatic as, without doubt, the diagnostic paradigm offers some clear benefits to clinical and research practice: It provides a *lingua franca* for describing clusters of symptoms that facilitates communication between users of services, clinicians and researchers; it sets out a common metric for research programs; and it provides an organizing principle for the development and evaluation of diagnosis-led assessment and treatment approaches (Hayes & Hofmann, 2018). Finally, for some, the biomedical model at the heart of the diagnostic approach also brings a legitimacy to the suffering that is experienced, reducing stigma and deflecting pejorative judgments that mental ill health reflects some form of personal weakness on the part of the diagnosed.

Despite these advantages of the diagnostic paradigm, there is a gathering apprehension that the taxonomic approach instantiated in the *DSM* and ICD runs counter to the available clinical and research evidence and may hamper our understanding of mental ill health and consequently how we manage and treat mental distress (Insel, 2014; Kotov et al., 2017). Here we touch briefly on seven areas of concern that have currency within this debate. We focus predominantly on so-called common mental health problems (Craig & Boardman, 1997), captured by the various diagnoses of mood disorder, anxiety disorder, stressor-related disorders, and obsessive–compulsive disorders within the diagnostic manuals, but the arguments of course extend beyond these presentations.

Seven Challenges for the Diagnostic Paradigm

The Underlying Biopsychosocial Processes are Transdiagnostic

A perhaps unintended consequence of the psychiatric diagnostic paradigm is the notion that diagnoses somehow capture or reflect the underlying reality of the world, carving nature at its joints and identifying natural kinds of "mental disorder." This idea stems from general medicine, where the majority of physical illnesses and diseases reflect qualitatively different states of health with one or a small number of identifiable and discrete causes. This is not the case for mental health problems where it is generally accepted

that causes are not only complex, multiple and interactive but as yet poorly understood (Kendler, 2008, 2012). What we know is that mental ill health prototypically emerges from an interplay between myriad biological, behavioral, psychosocial, and cultural processes that do not respect established diagnostic boundaries, where the interactions are multifarious, and modulated by an individual's lifelong experiences of the world.

The Symptom Space is Dimensional

Within the diagnostic manuals, symptoms are thresh-holded, imposing binary notions of "present" versus "absent" (Regier, Kuhl, & Kupfer, 2013). Groupings of symptoms deemed to be present then comprise the different diagnoses albeit with guidance on severity qualifiers for "mild," "moderate," and "severe" manifestations of individual diagnoses. However, evidence overwhelmingly suggests that mental health symptoms are not all-or-none phenomena, but are better conceptualized along continuous dimensions within the population as opposed to these distinct categorical entities (Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Indeed, there is a lack of compelling evidence for even a single symptom or disorder being a distinct category (Haslam, Holland, & Kuppens, 2012).[1]

This imposition of artificial categories onto a multidimensional space inevitably sacrifices much of the richness of the available clinical information, contributing to diagnostic instability with symptoms falling above or below imposed thresholds over time, as well as reduced interrater reliability as assessors struggle to elucidate whether marginal symptoms cross the designated thresholds (Markon, Chmielewski, & Miller, 2011). Most importantly, many individuals experiencing psychological distress fall short of the criteria for any diagnosis, despite a manifest need for care (Kotov et al., 2018).

Rampant Comorbidity and Poor Discrimination Between Supposedly Different Disorders

Comorbidity—when someone presents with a profile of problems that satisfy the criteria for more than one diagnosis at a time—is not a problem per se for the diagnostic model, with the notion of secondary diagnoses and/or complications of primary problems woven into the fabric of psychiatric taxonomies since the outset. However, of greater concern is that epidemiological findings reveal that comorbidity among psychiatric diagnoses is the rule rather than the exception, and single, uncomplicated clinical presentations are actually relatively scarce (Kessler et al., 2005). Such comorbidity is associated with greater clinical severity and functional impairment (Wittchen et al., 2011), higher rates of symptom chronicity (Rapaport, Clary, Fayyad, & Endicott, 2005) and a greater detriment to overall quality of life (Hofmeijer-Sevink et al., 2012). This "rampant" (Clark, Cuthbert, Lewis-Fernández, Narrow, & Reed, 2017) diagnostic comorbidity suggests that the normative coexistence of psychiatric disorders must, to a considerable extent, be an artifact (e.g., Maj, 2005) arising from the structure of the categorical classification system itself, rather than the co-occurrence of genuinely separable syndromes (van Loo & Romeijn, 2015).

Massive Heterogeneity Within Diagnoses

Formal diagnoses of different disorders typically comprise a number of criteria—clusters of conceptually similar symptoms that are heuristically grouped together. Most criteria contain more than one symptom and one or more of these symptoms would need to be present for the criterion to be met. Typically, the overall diagnosis then further depends on a specified number of criteria being satisfied. Even for diagnoses where criteria are not explicitly offered, diagnoses normatively require only a subset of symptoms from a larger set to be present. This polythetic checklist approach means that individuals receiving the same diagnosis can present with very different symptoms such that each diagnostic category incorporates built in heterogeneity.

To illustrate, within the *DSM–5* major depressive disorder (MDD) diagnosis, two individuals meeting criteria for MDD could potentially have only one symptom in common from the nine listed in the Manual. Indeed, when we account for all of the subsymptoms and directional qualifiers, there are 16,400 different symptom profiles that all qualify as MDD (Fried & Nesse, 2015). Such heterogeneity is orders of magnitude greater for complex criteria-based diagnoses such as posttraumatic stress disorder where there are 636,120 permutations that qualify for the diagnosis (Galatzer-Levy & Bryant, 2013).

How does this play out in actual epidemiological data? In the Sequenced Treatment Alternatives to Relieve Depression (STARnD) data ($N = 3,703$), Fried and Nesse (2015) identified 1,030 unique MDD symptom profiles, of which 864 (83.9%) were endorsed by fewer than six participants, with almost half of the profiles (501; 48.6%) endorsed by only a single individual. Indeed, the most common profile was only met by 67 people.

A primary function of any diagnostic system should be to facilitate our understanding of a complex problem space by organizing central, recurrent patterns into discrete categories. The data on heterogeneity cast doubt on whether this pragmatic aim of the psychiatric paradigm has even come close to being realized.

Incomplete Symptom Capture

A central question for the compilers of diagnostic compendia is which symptoms to include as prototypical to delineate a given disorder given that many symptoms of mental health problems also characterize everyday life; for example, tiredness, low mood, and so on and many disorders are associated with a multiplicity of signs and symptoms. The case of depression again provides a revealing illustration. If we look at established measurement tools for depression, there are some 280 different instruments developed in the last century, of which many are still in use (Santor, Gregus, & Welch, 2006). These assessment instruments differ markedly in the signs and symptoms that they capture. For instance, Fried (2017) notes that across the seven most commonly used depression assessment tools, 52 distinct depression symptoms are measured (compared with the nine symptoms listed in the *DSM–5*), with 40% of those symptoms appearing in just one of the seven scales and only 12% appearing across all seven. Notwithstanding the fact

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[1] For the *DSM–5* there were originally much more radical plans to incorporate dimensionality, especially within the personality disorders, but these did not come to fruition (Kraemer, 2007).

that some of these 280 instruments may have weak clinical validity, the wide scope of clinical signs and symptoms covered suggests that there is no single set of cardinal symptoms that defines depression (and by extension other diagnostic categories) and consequently that the profile outlined in the diagnostic manuals may be overly narrow or rigid, failing to reasonably capture the range within the clinical data.[2]

Phenotypic Plasticity Across Development and The Life Course

Mental health problems can morph across development and the life course such that individuals satisfy criteria either for different diagnoses or present differentially within the same diagnosis across time; for example, shifting between anxiety and unipolar depressive disorders (Fichter, Quadflieg, Fischer, & Kohlboeck, 2010), within anxiety disorders (Wittchen, Carter, Pfister, Montgomery, & Kessler, 2000, 2008) or within depressive disorders (Oquendo et al., 2004). Some of this phenotypic plasticity is a function of development, but the nature of the diagnostic approach itself arguably also contributes with its reliance on cross-sectional "snapshot" dichotomizations of what are in fact dimensional and dynamic symptom constructs that will wax and wane across time (Bystritsky, Nierenberg, Feusner, & Rabinovich, 2012).

Diagnosis-Driven Clinical Intervention

A much-vaunted advantage of diagnostic taxonomies is facilitated clinical assessment, management and intervention. This has led, within the domain of psychological interventions which is our primary focus here, to the establishment of an evidence-base for a plethora of single-disorder-focused treatment approaches. These are then endorsed by diagnostically organized guidelines such as those compiled by the United Kingdom's National Institute for Health and Care Excellence (NICE; Pilling, Whittington, Taylor, & Kendrick, 2011). Comorbid conditions are generally either glossed over, or minimally treated within these intervention packages and there little attention is paid to symptoms that fall outside of the diagnostic rubric. However, the majority of mental health treatments of all types actually appear to be effective across broad ranges of clinical populations, for example drugs such as selective serotonin reuptake inhibitors (SSRIs) and benzodiazepines, and psychological protocols such as cognitive-behavior therapy (CBT), or extinction-based approaches for anxiety-related difficulties. There is thus a mismatch between the clinical reality on the ground and the nature and scope of the recommended interventions. As a result, much of real-world clinical practice eschews the diagnosis-led treatment evidence base, preferring instead eclectic combinations of treatment elements tailored to the presentation and formulation of individual clients. This pragmatic approach enables goodness-of-fit matching of interventions to specific vulnerabilities and processes relevant to the individual, and provides a flexible treatment model that can be applied across a range of presentations including, critically, complex formulations, comorbidity, and subsyndromal or prodromal symptoms.

A Transdiagnostic Alternative

These diverse concerns about the diagnostic approach stem somewhat independently from research and scholarship across the three intellectual domains of classification and nosology, basic biopsychosocial research, and clinical science. Perhaps unsurprisingly, therefore, the alternative transdiagnostic approaches that abnegate the traditional psychiatric paradigm have also evolved and matured somewhat separately in each of these spheres, as we highlight below.

Within each of the three domains, the degree to which the diagnostic model is forsaken and consequently the strength of the transdiagnostic proposals vary. What we shall call here "soft" transdiagnostic approaches preserve the underlying diagnostic classification while seeking to elucidate processes or develop interventions that have relevance to one or more of the diagnoses as traditionally formulated. In contrast, more radical, "hard" transdiagnostic approaches dispense with the diagnostic system altogether, seeking to replace it with alternative frames of reference that characterize mental ill health in new ways.

Transdiagnostic Approaches to Classifying Mental Health Problems

The established diagnostic taxonomy has been generated through consensual decision-making by groups of experts under the auspices of learned bodies (Blashfield, 1984). Although this "authoritative" approach (Krueger et al., 2018) relies on some empirical data (e.g., the *DSM* field trials; Regier, Narrow, et al., 2013), this is secondary to the influence of expertise, tradition and politics. An alternative approach to the *ex cathedra* diagnostic manuals is fully empirical, focusing on the quantitative structure of signs, symptoms, and behaviors associated with mental health and distress, and deriving classification frameworks based on the resultant data.

The overwhelming weight of evidence from decades of such data-driven efforts indicates that mental health problems are best conceptualized along a series of continua rather than as discrete categories (Haslam et al., 2012; Waszczuk et al., 2017). Alternative categorical delineations of the mental health symptom space, and hybrid models that combine dimensional and discrete components, do have their proponents (Blashfield, 1984; Goekoop & Goekoop, 2014; Masyn, Henderson, & Greenbaum, 2018) but the bulk of the evidence favors dimensionality. The broadest empirical support is that these dimensions are organized hierarchically. Here, as an illustration of this approach, we focus on one attempt to generate such a hierarchical framework—the Hierarchical Taxonomy of Psychopathology (HiToP; Kotov et al., 2017).

The HiToP architecture (see Figure 1) emerges from multiple data sets with a combined sample size of over 100,000. HiToP includes a general factor of psychopathology at the apex, followed by a number of broad dimensions of disorder at the next level—spectra—including, for example, internalizing and disinhibited/externalizing problems. These higher-level spectra sit above lower-order dimensions that align with subsets of traditional diagnoses or disorders that tend to co-occur (Slade & Watson, 2006). These syndrome-level dimensions themselves sit above lower-order levels of symptom components and individual signs and symptoms.

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[2] These concerns about heterogeneity within diagnoses (see above) and incomplete capture of the prototypical symptom presentations of different putative disorders obviously pull in different directions.
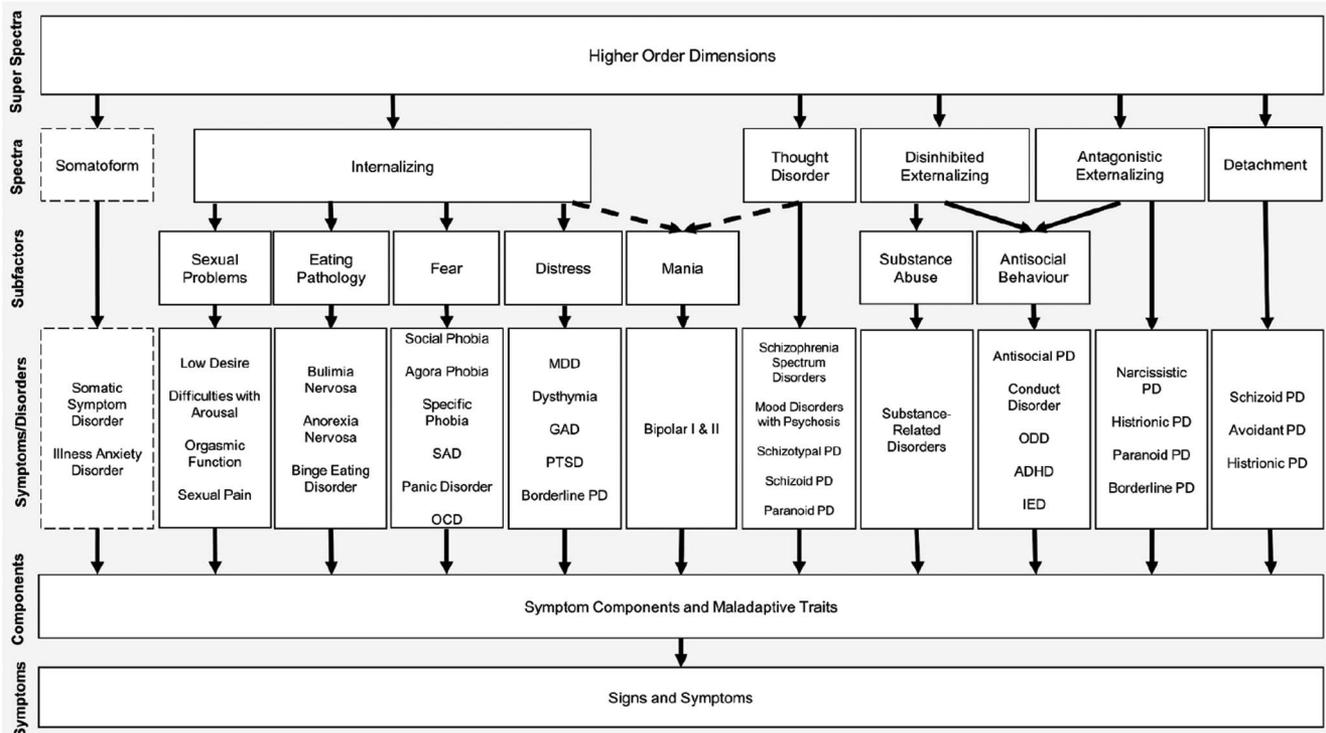
Figure 1. The hierarchical taxonomy of psychopathology (HiToP; Kotov et al., 2017). MDD = major depressive disorder; PD = personality disorder.

Alternative approaches other than HiToP favor a bifactor structure where lower-order dimensions are not nested within broader higher-order factors, but instead explain unique residual variance that is not accounted for by the higher-order constructs (e.g., Caspi et al., 2014; Lahey et al., 2012; Snyder, Young, & Hankin, 2017). The breadth of ambition varies across dimensional approaches, with HiToP aspiring eventually to guide clinical assessment and intervention (Ruggero et al., 2019) and accommodate dimensions of personality as well as developmental trajectories, including cognitive risk dimensions (Kotov et al., 2017; Schweizer, Snyder, Young, & Hankin, 2020), whereas other approaches are somewhat narrower in scope (Craddock & Owen, 2010).

There are myriad advantages to such dimensional frameworks. They are firmly grounded in empirical science, therefore not only reflecting the underlying dimensional nature of the explicanda but also sidestepping many of the sociopolitical concerns that dog the traditional "top-down" diagnostic model. They appear to have greater reliability than discrete diagnoses, both between raters (Markon et al., 2011) and across time (e.g., Eaton et al., 2013). A dimensional structure also seems to map more closely onto underlying biopsychosocial processes (e.g., Weinberg, Kotov, & Proudfit, 2015) and both genetic (e.g., Hicks, Foster, Iacono, & McGue, 2013; Kendler et al., 2011) and environmental (e.g., Keyes et al., 2012) vulnerability factors. Dimensions also provide a more compelling framework for thinking about the course of mental health difficulties as they fluctuate across time, in contrast to categorical thresholds with their imprecise notions of "in episode," remission, and recovery (Kotov et al., 2017).

The dimensional architecture is additionally able to deal with many of the structural issues that bedevil diagnostic taxonomies. Comorbidity is accounted for by higher-order dimensions that code regularities across related lower-order constructs and the dimensional nature of lower-order component and symptom-level layers provides a level of description that captures the broad heterogeneity that characterizes diagnoses.

Clinically, the dimensional taxonomy has potential advantages. Arguably, dimensional approaches lie at the heart of clinical practice where critical triage decisions revolve around whether to intervene and, if so, what level of intervention is indicated, based on severity of symptoms or clusters of symptoms (Helzer, Kraemer, & Krueger, 2006; Ruggero et al., 2019; Waszczuk et al., 2017).

A final potential strength of the dimensional approach, as operationalized within HiToP, is that it reflects the efforts of a consortium of like-minded researchers, numbering more than 70, with backgrounds in diverse disciplines. The size of the task—to comprehensively map the symptom space of mental health—requires this kind of collaborative effort. The historical and political momentum behind the currently dominant diagnostic model requires a broad, robust, and consensus set of counterproposals of the sort that are unlikely to emerge from more localized classification efforts.

The dimensional hierarchical paradigm is not without its issues. At present, despite their overt reliance on data-driven, empirical analysis, the focus of dimensional approaches is nevertheless predominantly to reorganize the same symptom space that is the purview of the diagnostic approach. Consequently, the explicanda

remain a function of the nonempirical top-down choices about which symptoms are central to mental ill health, that originate with and characterize the psychiatric model. Potentially, empirically driven or theoretically aligned approaches to identifying the range of relevant signs and symptoms would generate a somewhat different hierarchical structure.

A related issue concerns the interaction between different dimensional components. Clinical data reveal that symptoms interact with each other as networks of associated problems in theoretically meaningful ways; for example, sleep problems might drive low mood and poor concentration (Borsboom, 2017; Borsboom & Cramer, 2013). Indeed, proponents of network approaches argue that apparent higher-order dimensions or categories of symptoms such as diagnoses may simply emerge from the proliferation of chain reactions of symptoms reciprocally activating each other (Cramer, Waldorp, van der Maas, & Borsboom, 2010). According to this analysis, the nature and dynamics of these interactive networks should be the prime clinical focus (McNally, 2016). At present, hierarchical taxonomical approaches are mostly agnostic about how within- and across-levels of such taxonomies the different components dynamically interact across time, although in principle the two approaches are not mutually exclusive and a recent network analysis has attempted to integrate the two (Funkhouser et al., in press).

It is also, by definition, unclear what constitutes clinical "caseness" within a dimensional approach. This is not insurmountable—clinical cut-offs can easily be projected onto individual dimensions—but the issue quickly becomes challenging once multidimensional constructs are considered together.

Finally, although the reliance on data-driven approaches to compile the hierarchical taxonomy represents an advance over the decision-by-committee model of the diagnostic manuals, it nevertheless remains atheoretical. Without theory, there is an explanatory vacuum concerning why dimensions are organized as they are, or about what determines an individual's clinical presentation in terms of his or her positioning on multiple dimensions. In terms of psychological interventions, the absence of theory makes it difficult to see how the dimensional model can easily translate into novel clinical approaches. Psychological interventions are not conceptualized in terms of symptoms or syndromes, but rather to act on identified precipitating and maintaining processes that are deemed to be mutable. Without adequate theory driving intervention development, dimensional approaches will likely struggle in the same way as diagnostic approaches to bridge the translational gap (though see Ruggero et al., 2019, for a recent discussion).

Transdiagnostic Biopsychosocial Processes

As already noted, a foundation stone of the transdiagnostic approach is that the risk, protective, and maintenance factors and processes implicated in mental health problems, whether they be biological, socioenvironmental, or psychological, show no specificity for particular diagnostic disorders but rather appear to operate across traditional nosological boundaries (Buckholtz & Meyer-Lindenberg, 2012). Quantitative and molecular genetic studies (e.g., Otowa et al., 2016; Pettersson, Larsson, & Lichtenstein, 2016), structural and functional brain research (e.g., Baker et al., 2019; Goodkind et al., 2015; McTeague et al., 2017; Meyer, 2017; Shanmugan et al., 2016; Swartz, Knodt, Radtke, & Hariri, 2015),

studies investigating the influence of environmental factors such as poverty, discrimination, loneliness, aversive parenting, and childhood trauma or maltreatment (Green et al., 2010; Käll et al., 2020; Keyes et al., 2012; Lehavot & Simoni, 2011; Sunderland et al., 2016; Wiggins, Mitchell, Hyde, & Monk, 2015), and investigations of psychological processes (Gellatly & Beck, 2016; Hayes & Hofmann, 2018; Shanmugan et al., 2016; Sharma et al., 2017; Wahl et al., 2019), all support biopsychosocial factors that transcend diagnostic precincts. Indeed, to date no biological markers or cognitive processes have been identified that are uniquely associated with a specific disorder (Kupfer, First, & Regier, 2002; Widiger & Samuel, 2005).

This transdiagnostic picture led the National Institute of Mental Health (NIMH) in 2009 to "*Develop, for research purposes, new ways of classifying mental disorders based on dimensions of observable behavior and neurobiological measures*" in the form of the Research Domain Criteria (RDoC), thus abandoning the diagnostic approach that it had championed for the previous three decades. The RDoC framework (Insel et al., 2010) is an epistemic infrastructure that parses mental health complexity into six supraordinate domains (see Supplementary Table S1): positive valence systems, negative valence systems, cognitive systems, systems for social process, arousal/modulatory systems, and sensorimotor systems, each divided into a number of constructs and subconstructs (e.g., negative valence systems includes constructs such as "acute threat," "sustained threat," and "loss") that can be interrogated at different units of analysis, comprising: genes, molecules, cells, circuits, physiology, behavior, self-reports, and paradigms.

Within each unit, elements for potential investigation are identified; for example, "avoidance" as a unit of behavior relevant to the construct of acute threat. RDoC builds on previous, albeit more localized, efforts to identify transdiagnostic processes such as Harvey and colleagues' ground-breaking 2004 book (Harvey, Watkins, Mansell, & Shafran, 2004) that identified a portfolio of transdiagnostic cognitive processes (e.g., selective attention, overgeneral memory, repetitive negative thinking) that manifest in both clinical (i.e., diagnosed) and nonclinical samples, and that had been implicated across four or more disorders (see Supplementary Table S2). This initiative formed the basis for a swathe of process-driven interventions either focused on individual processes that have a transdiagnostic reach, for example memory specificity training (Werner-Seidler et al., 2018), attentional bias modification (MacLeod & Clarke, 2015), interpretive bias modification for specific processes such as repetitive negative thinking (RNT; Hirsch et al., 2020), attentional control training for cognitive anxiety sensitivity treatment (Allan, Albanese, Judah, & Schmidt, 2020), or that encompass a broader set of processes within the context of established intervention paradigms, for example rumination focused CBT (RfCBT; Watkins, 2016) or augmented depression therapy (ADepT; Dunn et al., 2019), along with process-based CBT more broadly (Hayes & Hofmann, 2018).

The rationale for RDoC (and related efforts) is to provide a framework for research into the biopsychosocial substrates of mental ill health. This ambition is deeply laudable but it also raises an interesting and challenging question—how do we decide what constructs to include? RDoC identifies a number of inclusion criteria. Most central is the judgment that a construct is "relevant" to understanding some aspect of "psychopathology" (Brent et al., 2018; Morris & Cuthbert, 2012). But, of course, this judgment

rests on elucidating responses to two issues at the heart of the discipline—how we define "relevance" and how we characterize psychopathology.

The characterization of psychopathology is admirably open-ended in the RDoC. They argue persuasively that the priority is to facilitate the evaluation of hypothesis-driven research questions that pertain to clinically significant symptoms or dysfunction. It is therefore as legitimate to look at symptom dimensions (for instance, at any level of a hierarchical framework such as HiTOP) as to consider clusters of classically defined *DSM* disorders (Cuthbert, 2015), or even presumably single disorders.

With respect to "relevance," RDoC characterizes constructs as relevant to psychopathology as a function of ". . . *increasing deregulation in functionality that can be construed as falling at one extreme or the other of the normal distribution*" (Cuthbert, 2015; p. 95). This raises the question of what constitutes a dysfunctional ("deregulated in functionality") process. It seems clear that, despite RDoC's claims, falling at an extreme of the normal distribution is not always itself sufficient without some additional notion of impairment or maladaptiveness (Wakefield, 2014). For instance, extreme avoidance of threat is adaptive when in a highly threatening environment such as a combat zone but arguably becomes maladaptive in low-threat contexts (Berenbaum, 2013). Furthermore, even if one-tailed of the normal distribution does reflect dysfunctionality, that does not mean that both tails do; for instance, poor working memory may be dysfunctional, but at the other extreme it is unlikely to be a source of concern, however excellent it is (Cuthbert & Insel, 2013).

Finally, constructs do not even have to fall at extremes of the distribution under any circumstances to be relevant to psychopathology. The first two RDoC domains—negative and positive valence systems—combine identified processes (e.g., attention) that acting upon particular content (positive or negative information) to organize constructs where it is perhaps easier to see how extremities of the distribution of operation may be dysfunctional (although see the attentional bias example below). However, other RDoC domains—cognitive systems, social processes, and so forth—eschew content entirely. This means that processes within these domains could be operating entirely normatively *but on dysfunctional content* and it is the latter that confers the "relevance" to psychopathology. Indeed, this interaction between normative processes and difficult content is a cornerstone of most cognitive models of emotional disorder (Beck, Rush, Shaw, & Emery, 1979; Power & Dalgleish, 2015). For instance, having an entirely normative ability to understand one's own agency (an RDoC element) while trapped in a coercive relationship where one is disempowered, reflects the operation of a normative process in a dysfunctional context. Here, arguably, the process-content interplay of self-perceived disempowerment is profoundly relevant to understanding the mechanisms underlying any psychopathological response.

Relatedly, different RDoC constructs, each operating within normative ranges, may interact with each other to generate disturbed or dysfunctional responses relevant to psychopathology; for instance, for some individuals (those with depression or vulnerable to manic episodes) rewarding experiences might be experienced as threatening, leading to avoidance behavior, without any abnormalities in the functioning of the positive or negative valence systems themselves. Finally, RDoC constructs operating within the norma-

tive range may nevertheless be relevant to understanding risk or vulnerability to mental health problems. For example, those processes may represent diatheses such that encountering a particular context will precipitate the onset of difficulties.

If we do set aside the criterion that the processing constructs themselves have to be operating "abnormally" (i.e., at extreme ends of the normal distribution), this means that we are left with no obvious way to construe a given construct as problematic or dysfunctional. Similarly, it becomes impossible to apply cut-offs to define, for example, mild, moderate, or severe levels of dysfunction. Indeed, once we relax the "abnormality criterion," it becomes difficult to rule out almost any process as relevant to psychopathology due to the systemic nature of the majority of mental health problems where the multiplicity of mental operations are implicated. If this is the case, then initiatives such as RDoC will *de facto* eventually spawn frameworks for conceptualizing the different levels of processes involved in human mental life, rather than anything specific to psychopathology. This would arguably edge RDoC and like systems toward unfalsifiability in terms of their stated aims as it would be unclear what would constitute an irrelevant process.

Part of this problem lies with the boundary conditions around the concept of "relevance" itself. Across the developmental trajectory that RDoC promotes (Casey, Oliveri, & Insel, 2014), there will be countless factors and processes associated with either the outcome of mental health problems or the risk thereof. All of these constructs are therefore "relevant" in the broadest sense but without appropriate theories about the etiology of particular difficulties, it is hard to distinguish processes that are proximally causal from those that are either distally causal or merely associated with mental health problems. For example, an attentional bias toward threat (an RDoC subconstruct) seems clearly associated with many anxiety- and stressor-related conditions (Mogg, Mathews, & Eysenck, 1992), and has been shown (in experimental manipulations) to elevate feelings of anxiety (MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002). This has led to a plethora of 'cognitive bias modification' interventions to retrain the attentional system away from threat as a putative treatment for anxiety (MacLeod & Clarke, 2015). However, to date these approaches appear to have limited longer-term impact on anxiety symptoms (Cristea, Kok, & Cuijpers, 2015; Jones & Sharpe, 2017). Why might this be? Cognitive theories of anxiety disorders would argue that much of the attentional bias is driven by deep-rooted beliefs or models of the world that confer danger on the stimuli that are attended to (Bar-Haim et al., 2007; Wells & Matthews, 1994) and so the deep cause of the anxiety problems is the possession of such beliefs. Consequently, retraining attention away from threatening stimuli will only have short-lasting effects on anxiety as relatively quickly the underlying belief representations will simply recalibrate the attentional system to be alert for the specified dangers once more. An analogy would be the common experience of preferentially noticing other cars on the road that are the same as, say, one's own red Jeep. You could train your attention system away from red Jeeps and toward blue Land Rovers, but as long as you continue to drive about town in your Jeep it is most likely that you'll soon be noticing other Jeeps again. However, if you traded in the Jeep and acquired a new blue Land Rover, then the attentional bias for Jeeps would eventually fade away. It is the ownership of the Jeep that is

central here and the attentional bias for Jeeps simply flows from that.

Aspiring to a deeper understanding of causality when considering the role of transdiagnostic biopsychosocial processes raises another question. How do we distinguish causal processes that are relevant to developing clinical interventions from those that are perhaps less helpful? Wakefield (2014) uses the analogy of a plane crash. Both a failed engine, for example, and gravity are causally involved in the crash, but efforts to understand what went wrong and how to use those insights to prevent future crashes are better focused on the engine's vulnerabilities rather than gravity. To develop interventions, therefore, we need to focus on causal processes that are tractable and malleable through intervening, as opposed to those processes that are relatively immutable. Harvey, Murray, Chandler, and Soehner (2011) make a related point distinguishing between processes that are "descriptively transdiagnostic" (i.e., present in a range of diagnoses), from those that are "mechanistically transdiagnostic" (i.e., reflecting a causal, functional mechanism).

Finally, other thorny issues pertaining to process causality that present a challenge for how we map processes onto mental ill health presentations concern how to make sense of multifinality—whereby the same causal pathway appears to lead to a range of different mental health difficulties—and equifinality whereby multiple causal pathways appear to give rise to the same outcome (Cicchetti & Rogosch, 1996).

As with the pioneering approaches to transdiagnostic nosology, RDoC seeks to maintain a theoretical neutrality. This reticence of RDoC to align itself with any given theoretical paradigm is understandable, and echoes the philosophy of the post-*DSM–III* approach in the *DSM*, but it is questionable whether any such endeavor that aspires to address questions of causality and mechanism with a view to capitalizing on those insights to develop novel process-based interventions can really succeed without clear theoretical principles that provide a basis for sorting the mechanistic wheat from the chaff, even if those theories will inevitably require refinement over time (Mansell, 2019).

Transdiagnostic Clinical Approaches

Transdiagnostic clinical interventions that ". . . *apply the same underlying treatment principles across mental disorders, without tailoring the protocol to specific diagnoses*" (McEvoy, Nathan, & Norton, 2009, p. 21), have evolved over the last 20 years in parallel with, but mostly independently from, the developments in transdiagnostic nosology and process-based science outlined above. The post-*DSM–III* impetus has come from two sobering aspects of clinical reality. First, the aforementioned rampant comorbidity and pervasive heterogeneity of clinical presentations, which ensures that tailored single diagnosis-led protocols often struggle to address the range of problems with which clients present. Second, the real need to do more to improve the effectiveness of our psychological (and pharmacological) interventions, where even our best available diagnosis-led treatments only achieve clinical recovery for 40–70% of patients, depending on their primary diagnosis, with people suffering complex comorbid conditions faring significantly worse (Moses & Barlow, 2006). The primary rationale for transdiagnostic clinical interventions therefore is that they should better address the heterogeneity and comorbidity that is the modal

presentation in real-world services, thus delivering improved clinical effectiveness (Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010).

Transdiagnostic psychological interventions fall into two broad categories (Meidlinger & Hope, 2017; Sauer-Zavala et al., 2017). Universal interventions such as the *Unified Protocol for Transdiagnostic Treatment of Emotional Disorders* (Barlow et al., 2010) promote a one-size-fits-all approach where all clients receive the same set of therapeutic elements that have been carefully selected to have the broadest applicability across diagnoses. The fact that practitioners can adopt such universal approaches without modification for a wide range of mental health conditions has a number of practical advantages. Clinical application is easier as there is no bespoke selection of intervention elements. Clinical training is also facilitated thus minimizing barriers to dissemination, compared with standard training models that involve learning multiple treatment protocols for different disorders (Steele et al., 2018). However, a drawback of universal approaches is that their very universality precludes tailored selection of treatment elements to the particular presentations of individual clients.

In contrast, modular approaches, such *The Modular Approach to Therapy for Anxiety, Depression, Trauma, or Conduct Problems* (MATCH-ADTC) for children (Chorpita, Daleiden, & Weisz, 2005b) and the *Shaping Healthy Minds* protocol targeting the same range of problems in adults (Black et al., 2018), comprise sets of evidence-based self-contained functional units (therapy modules) that can operate independently and be delivered flexibly, so that module selection and order are tailored to the needs of each client. For example, Evans et al. (2020) present the potential application of the MATCH-ADTC protocol for children with severe irritability. Modular interventions are more challenging to deliver than universal protocols, requiring algorithms to match module delivery to the separate requirements of each client, but this in principle comes with a better goodness-of-fit between the therapy and the individual clinical presentation (see Supplementary Table S3 for an outline of the intervention components in selected universal and modular transdiagnostic approaches).

Transdiagnostic interventions also vary in their breadth of application (Craske, 2012). Some focus on a relatively narrow range of clinical presentations such as Fairburn's transdiagnostic approach to eating disorders (Fairburn, Cooper, & Shafran, 2003), whereas other approaches have a much broader purview, for example Transdiagnostic Group CBT for anxiety (Norton, Hayes, & Hope, 2004). There is an obvious trade-off, with greater breadth meaning that the intervention is perhaps less tailored for the specifics of any individual constellation of symptoms or disorder.

Numerous systematic reviews and meta-analyses (Andersen, Toner, Bland, & McMillan, 2016; Newby, McKinnon, Kuyken, Gilbody, & Dalgleish, 2015; Newby, Twomey, Yuan Li, & Andrews, 2016; Pearl & Norton, 2017; Păsărelu et al., 2017; Reinholt & Krogh, 2014) broadly support the equivalence or superiority of transdiagnostic psychological treatments over comparison or control interventions (comprising either a diagnosis-specific intervention control, treatment-as-usual, or a waitlist control; summarized in Supplementary Table S4). As with all interventions, the nature of the comparison condition, and of the trial design more generally, are critical to evaluating efficacy and effectiveness. For example, one would not necessarily expect transdiagnostic interventions to be more efficacious than single-diagnosis-led protocols

for what one might characterize as the primary clinical (diagnostic) problem that the client presents with. Going forward, it therefore seems essential that the field develops consensus criteria for what would constitute compelling evidence that a transdiagnostic intervention is successful.

What Would Constitute Success for a Transdiagnostic Intervention?

Ever since Saul Rosenzweig pronounced Lewis Carroll's Dodo bird verdict—"*Everybody has won and all must have prizes*"—on the field of psychotherapy, it has generally been accepted that a significant proportion of the variance in psychotherapy effectiveness can be attributed to "common factors" (Cuijpers, Reijnders, & Huibers, 2019; Norcross & Wampold, 2011), such as patient expectations, structured regular sessions and the client–therapist relationship, that are shared by all psychotherapies (Chambless, 2002; Luborsky, Singer, & Luborsky, 1975). In addition to common factors, there are shared principles across interventions within each psychological therapy model—what we shall call "common processes." For example, CBT includes common processes that are shared by most, if not all, diagnosis-led CBT protocols (Hayes & Hofmann, 2018; see Supplementary Table S2). The combined contribution of these common factors and common processes to therapeutic outcomes has clear implications for understanding and developing any new interventions including transdiagnostic protocols, where arguably such components deliver much of the clinical impact. Additional efficacy is then delivered by specific therapy ingredients tailored to particular clinical presentations (e.g., depression, panic)—what we shall call for the present purposes "diagnosis-specific processes." Transdiagnostic protocols are predicated on the assumption that they contain such diagnosis-specific therapy ingredients for *multiple* disorders, whereas single diagnosis-led interventions heavily focus on diagnosis-specific processes only for the primary disorder that they target.

In Figure 2, inspired by DeRubeis, Gelfand, German, Fournier, and Forand (2014), to understand the impact of these different processes on clinical outcomes, we consider the putative contributions to therapeutic efficacy (using CBT as an exemplar) of common factors, common processes, and diagnosis-specific processes, for hypothetical patients presenting with comorbid clinical problems. In other words, where there is an identifiable primary problem or disorder (e.g., depression) that would inform choice of a diagnosis-led treatment, alongside comorbid difficulties (e.g., panic, social anxiety) that arguably also require intervention.

Figure 2 therefore compares a hypothetical diagnosis-specific CBT intervention targeted at a "primary diagnosis"[3] against, both universal and modular hypothetical transdiagnostic CBT interventions, which both target primary and comorbid diagnoses equally. We compare all three of these active CBT interventions against both a placebo- or attention-control condition (i.e., something that includes common factors but not common processes or diagnosis-specific processes), and a wait-list control that lacks common factors, and any active processes.

For all of these five interventions and comparison conditions, there will be a proportion of patients who do not respond, showing no remediation of symptoms, either because their problems are intractable or because they are unable to engage with the interventions for practical or psychological reasons.[4] These nonresponders

aside, Figures 2A and 2B illustrate the predicted proportion of therapeutic response, for the remaining patients, offered by the different hypothetical intervention protocols for the primary diagnosis and comorbid disorder(s), respectively.

The figure illustrates a number of important points. First, for all conditions there will be a proportion of patients who spontaneously remit irrespective of the help they receive. Second, both diagnosis-specific and transdiagnostic CBT interventions should outperform wait-list and attention-control comparison conditions for both primary and comorbid diagnoses due to the common CBT processes that the three active interventions share and which the control conditions lack—a conclusion broadly supported by the literature (e.g., Newby et al., 2015; Supplementary Table S4). As a consequence, the lion's share of the variance in treatment response would be predicted to be comparable across these three active interventions and is accounted for by the combination of therapeutic nonresponse, spontaneous clinical remission, or the impact of shared common factors and common processes. Finally, as a result, the potential differences between the three active interventions are predicted to not only be small but also likely to differ as a function of whether we are considering the primary disorder or the comorbid difficulties with diagnosis-specific interventions likely to be more efficacious for the former, and transdiagnostic approaches more efficacious for the latter.

Of course, the figure is hypothetical but if the broad principles are true, this has a number of key implications for how we evaluate transdiagnostic clinical interventions:

1. The critical comparison for evaluating emergent transdiagnostic interventions should be against current gold-standard diagnosis-led approaches (Sauer-Zavala et al., 2017; Watkins, 2018). This has rarely been the case, to date (Supplementary Table S4). However, when considering this critical comparison, it is likely that for identified primary disorders, transdiagnostic approaches will actually be *less efficacious* than established diagnosis-specific treatments. Furthermore, for any comorbid disorders, the shared presence of both common factors and common processes across both diagnosis-specific and transdiagnostic interventions means that, although one would expect an efficacy advantage for transdiagnostic interventions due to their inclusion of a broader portfolio of treatment elements targeting diagnosis-specific processes, the effect size of such an advantage is likely to be small (Craske, 2012).

2. This has significant implications for clinical trial methodology within the transdiagnostic domain. First, evaluated clinical outcomes in trials will need to encompass not only the primary disorder but also any comorbid difficulties, if the benefits of transdiagnostic approaches

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[3] We have used the terminology of primary and comorbid diagnoses or disorders for ease of illustration but in principle the same points can be made for symptom clusters or dimensions.

[4] It is to be hoped that it is possible that precision medicine initiatives (e.g., Cohen & DeRubeis, 2018) will match individuals to interventions better suited to their specific difficulties to reduce the proportion of non-responders, although the clinical benefits of this approach are yet-to-be realized.
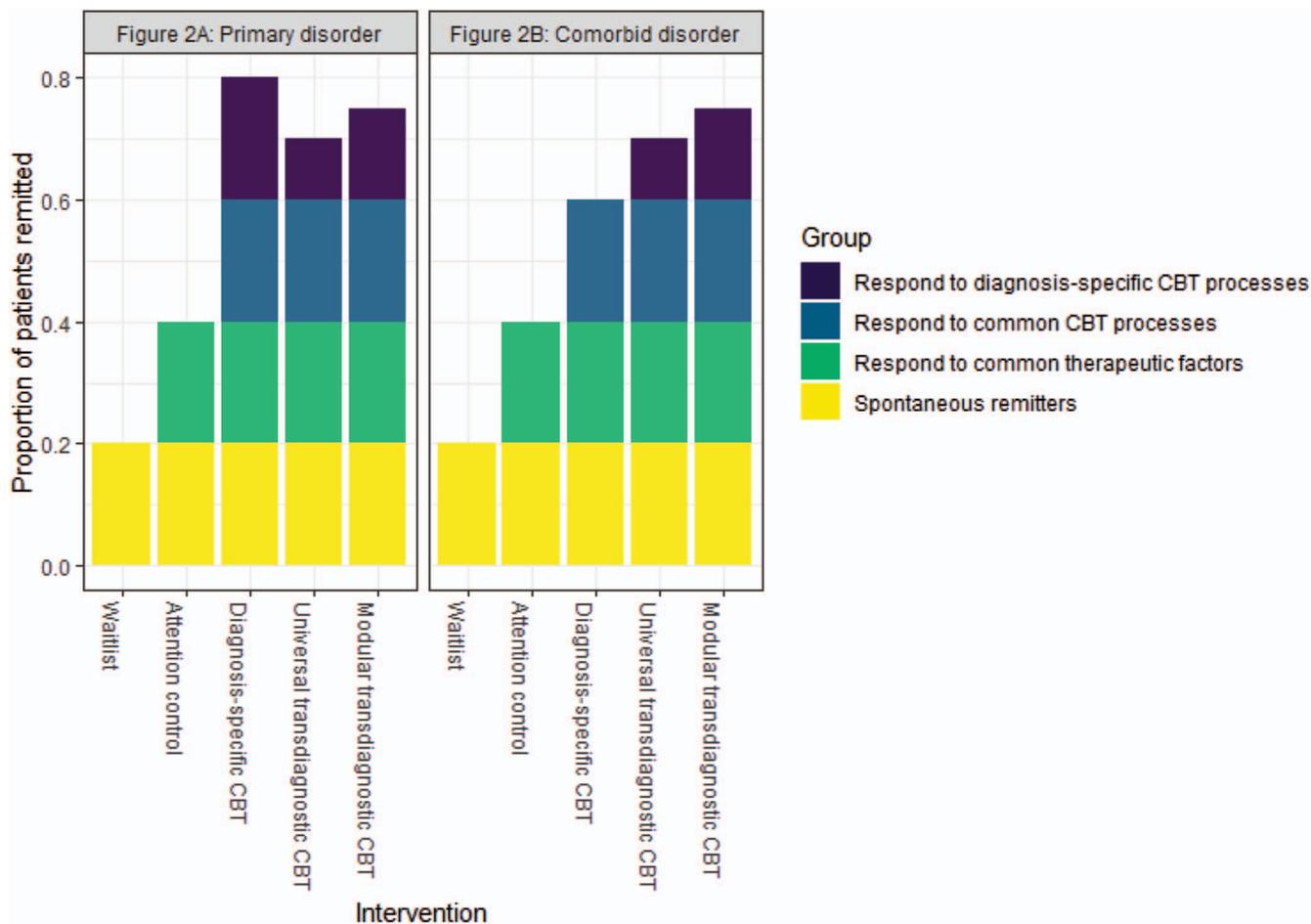
Figure 2. Predicted treatment responses (proportions of patients remitted) to diagnosis-specific and transdiagnostic interventions, and relevant control conditions. Treatment nonresponders are not included in the figure. CBT = cognitive-behavior therapy. See the online article for the color version of this figure.

are to be revealed. Second, novel trial designs will be required; for instance, hybrid designs comprising a non-inferiority component for comparing the transdiagnostic intervention relative to the diagnosis-led treatment for a primary disorder, alongside an additional superiority design component (favoring the transdiagnostic intervention) for the comorbid problems. Finally, even for this superiority component, hypothesized effect sizes are likely to be small and consequently requisite sample sizes will need to be large to provide adequate statistical power.

3. The likely small differences in efficacy between transdiagnostic approaches and established diagnosis-led interventions highlight the need for any proper evaluation of the utility of the transdiagnostic approach to extend beyond simple efficacy (Meidlinger & Hope, 2017; Watkins, 2018). As already noted, transdiagnostic interventions in principle confer significant advantages in terms of training and dissemination[5] and thus implementation within health care systems. This means that, in the

broader scheme, it is likely more cost-effective to disseminate and implement a smaller set of transdiagnostic approaches than a much larger set of diagnosis-specific interventions. The challenge for clinical trialists is to capture these benefits in their evaluations.

Linking Transdiagnostic Interventions to Transdiagnostic Processes

Even though many transdiagnostic interventions have an identified suite of therapeutic processes at their core—whether they be common factors, common processes, or diagnosis-specific pro-

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[5] It is important to note that this is not the same as saying that training and implementation are straightforward in the transdiagnostic domain. We know that training and dissemination for even more straightforward health-care approaches to mental health difficulties can prove very challenging (Proctor et al., 2009). Rather we are saying that it should be relatively better than the training and dissemination challenge posed when there are a multitude of similar and overlapping approaches to implement.

cesses for multiple conditions—empirically demonstrating that these processes genuinely represent the mechanisms of therapeutic action has proved a challenge, as it has for the field more generally (Cuijpers et al., 2019). One way forward is for embedded process-outcome studies that are theoretically informed and suitably statistically powered to become mandated for all large-scale clinical trials. Such studies should eschew simple correlational models, include a broad array of potential mediators, pay close attention to both dose-response relationships and temporal associations between mediating processes and outcomes, and be combined with adjunctive clinical science involving the experimental manipulation of potential mediators (Lorenzo-Luaces & DeRubeis, 2018).

Care also needs to be taken that putative mediating processes are properly activated or engaged within the assessment protocols as opposed to being assessed "cold." For example, if a treatment reduces symptoms of emotional distress, such a cold posttreatment assessment might show that dysfunctional thinking patterns typically associated with that distress are similarly mitigated. However, an experimental mood induction designed to activate patterns of "hot" cognition may reveal that such thinking styles are simply latent and easily reactivated following a downturn in mood (Kuyken et al., 2010; Teasdale, 1988).

We also need to move beyond the examination of between-participants nomothetic processes (e.g., differences in the therapeutic alliance) to include consideration of key idiographic processes that dynamically shift across time within individuals (e.g., how the alliance changes across the course of therapy). Modeling individual processes across time, as well as general and shared processes across individuals, can help better understand dynamic patterns in context to identify maintenance mechanisms and treatment targets (see Woods et al., 2020).

Perhaps a more fundamental process-related concern is the translational chasm between the process-relevant discovery science outlined above and intervention development. Almost all current evidence-based psychological interventions, with the possible exception of behavior therapy, have their roots in the clinic rather than the science laboratory. This is as true of transdiagnostic approaches where, to date, the vast majority of clinical advances have emerged through the distillation of existing evidence-based treatment elements (Chorpita, Daleiden, & Weisz, 2005a) from established diagnosis-led protocols—predominantly CBT. Very few, if any, transdiagnostic clinical applications have either emerged out of, or benefited from, advances in fundamental underlying transdiagnostic biopsychosocial process research, such as RDoC. Bridging this translational gap is a major challenge.

Five Challenges for Transdiagnostic Science

Having sought to summarize and evaluated the current state of transdiagnostic science, we now distil five challenges that require our collective attention if the field is to progress.

1. Development of relevant theory: Much of the transdiagnostic field rests on atheoretical foundations, especially work on core processes and nosology. As we have argued, although the rationale for this is understandable, it is not clear how the translational potential of this work into novel clinical approaches can be fully harvested without appropriate theoretical frameworks to guide it. A key challenge therefore is to develop metatheoretical models that transcend the established diagnosis-specific frameworks that currently drive clinical translation (e.g., Mansell, 2019; Power & Dalgleish, 2015).

2. A focus on mental content: The vast majority of clinical discourse between practitioners and patients concerns the *contents* of thoughts, beliefs, and assumptions about the world—negative thoughts, ruminative narratives, dysfunctional core beliefs, toxic mental images, and so on. Engaging with the nature of such mental content is consequently a cornerstone of major therapeutic models within the field, such as CBT. However, much of the work on fundamental transdiagnostic processes (e.g., within RDoC) is agnostic to the content of the material being processed (with important exceptions e.g., RDoC's "negative valence systems"). It seems deeply unlikely that a comprehensive understanding of how dysfunctional processes impinge on mental health will be achieved until the critical interactions between mental processes and mental content are appropriately understood and elucidated.

3. Setting diagnoses aside: We have drawn a distinction between "soft" and "hard" transdiagnostic approaches, with the former retaining a diagnostic framework yet seeking commonalities across diagnoses, and the latter more radically seeking to replace diagnoses with alternative formulations. We submit that a genuine alternative to the established diagnostic nosologies will only emerge once harder transdiagnostic paradigms are properly embraced.[6]

4. Developing fit-for-purpose research methodology: The current prototypical superiority clinical trial design that focuses on a single primary outcome is arguably unsuitable for the proper evaluation of transdiagnostic interventions. Large-scale hybrid designs (incorporating non-inferiority components), or other novel approaches (Blackwell, Woud, Margraf, & Schönbrodt, 2019), with multiple coprimary outcomes, and appropriate assessment of cost-effectiveness, are indicated. Such trials should also include mandated embedded process-outcome evaluations to address questions of what works for whom, what are the mechanisms of clinical change, and how intraindividual (idiographic) patterns of relationships between symptoms and processes change across time.

5. Prioritizing joined-up thinking: The diagnostic paradigm is long-lived and has an iron grip on current research and clinical practice in mental health. The majority of mental health care systems across the world have diagnoses at the heart of assessment, clinical practice, and health care

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[6] It may be that the case for a "hard" transdiagnostic line is more compelling for common mental health problems (National Collaborating Centre for Mental Health, 2011)—currently categorized as mood, anxiety, and stressor-related disorders—than for other constellations of difficulties.

structure. In terms of clinical research, localized research efforts are less likely to prise diagnostic fingers free than larger-scale consortia such as RDoC and HiToP, representing the collaborative efforts of many international scientists from multiple disciplines. Joining and supporting these consortia, while of course seeking to engage with any scientific and philosophical differences one might have with them from within, is therefore to be highly encouraged. Implementing transdiagnostic approaches into clinical practice will prove more of a challenge and rests crucially on the development of robust transdiagnostic assessment instruments and interventions that can supplant their diagnostic counterparts. The clinical jury remains out.

Preview of Articles in This Special Section

We have gathered a collection of original articles instantiating the key themes reviewed above. They provide an exciting snapshot of the plethora of research focusing on transdiagnostic approaches to common mental health problems.

In the domain of nosology, Schweizer et al. (2020) have applied a bifactor approach to internalizing and externalizing dimensions of cognitive and general psychopathology risk for early adolescents, younger youth, and older youth.

In the process domain, Allan et al. (2020) provide an excellent example of integrating process measures into clinical trials. They describe a multimethod investigation on how individual differences in a key process variable (attentional control) modulate clinical response in the context of a brief transdiagnostic treatment for anxiety and depression. Hirsch et al. (2020) describe an example of clinical translation from basic science on negative interpretation bias. They found that augmenting interpretation training for repetitive negative thinking with positive outcome generation and imagery facilitated more positive interpretations, reduced negative intrusions after training, and reduced trait rumination. Woods et al. (2020) modeled individual processes as well as general and shared processes across individuals with borderline personality disorder, finding a significant degree of heterogeneity in interpersonal and affective domains.

In the clinical domain, Evans, Weisz, Carvalho, Garibaldi, Bearman, Chorpita, and The Research Network for Youth Mental Health (2020) report on the evaluation of a modular, transdiagnostic, cognitive–behavioral intervention compared with standard manualized treatments and usual care for treating youth with severe irritability across multiple outcomes, informants, and measurement schedules. Finally, Käll et al. (2020) describe the use of a distillation and matching approach to identifying standardized evidence-supported interventions to reduce loneliness, by coding for the presence of cognitive–behavioral practice elements and maintaining mechanisms.

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* Denotes article from this Special Section of *Journal of Consulting and Clinical Psychology*.

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