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"Third-wave" cognitive and behavioral therapies and the emergence of a process-based approach to intervention in psychiatry

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For decades, cognitive and behavioral therapies (CBTs) have been tested in randomized controlled trials for specific psychiatric syndromes that were assumed to represent expressions of latent diseases. Although these protocols were more effective as compared to psychological control conditions, placebo treatments, and even active pharmacotherapies, further advancement in efficacy and dissemination has been inhibited by a failure to focus on processes of change. This picture appears now to be evolving, due both to a collapse of the idea that mental disorders can be classified into distinct, discrete categories, and to the more central attention given to processes of change in newer, so-called "third-wave" CBTs. Here we review the context for this historic progress and evaluate the impact of these newer methods and models, not as protocols for treating syndromes, but as ways of targeting an expanded range of processes of change. Five key features of "third-wave" therapies are underlined: a focus on context and function; the view that new models and methods should build on other strands of CBT; a focus on broad and flexible repertoires vs. an approach to signs and symptoms; applying processes to the clinician, not just the client; and expanding into more complex issues historically more characteristic of humanistic, existential, analytic, or system-oriented approaches. We argue that these newer methods can be considered in the context of an idiographic approach to process-based functional analysis. Psychological processes of change can be organized into six dimensions: cognition, affect, attention, self, motivation and overt behavior. Several important processes of change combine two or more of these dimensions. Tailoring intervention strategies to target the appropriate processes in a given individual would be a major advance in psychiatry and an important step toward precision mental health care.

Key words: Process-based approach, cognitive behavioral therapy, third-wave therapies, processes of change, cognition, affect, attention, self, motivation, overt behavior, precision mental health care

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For a field to progress over the long term, it needs to distinguish clearly its purposes from its strategies, so that new strategies can be adopted when progress bogs down in important areas. Such is the current situation in modern mental health science and practice. By virtually every metric, the incidence and prevalence of mental health problems is increasing worldwide, and our approaches to producing improvement are being challenged. Depression is now the number one cause of disability around the world[1] and rates of common mental health struggles have increased rapidly, especially among the young[2].

At the same time, biomedical treatments are becoming more generic rather than more specific, and effect size improvements for both psychosocial and biomedical interventions are minimal or absent[3]. Concern over side effects and unhealthy physiological opponent processes fostered by the long-term use of common classes of psychoactive medications is growing[4]. Full genomic mapping of hundreds of thousands of persons is failing to support a prominent role of genes in the etiology of common mental conditions[5].

In the context of such challenges, it is wise for the field to refocus on its purpose. If it does so, a large body of work is currently available to guide a new strategic approach.

Intervention science in psychiatry has long sought an understanding of human suffering that is based on the identification of functionally important processes of etiology, development, maintenance and change, so as to help individual clients achieve their goals through targeted and person-sensitive empirical methods. That long-term purpose of scientific analysis has been implicit in the entire field of mental health over the decades, but the strategies for getting there have differed across disciplines and eras. At times these strategies have disguised that ultimate purpose so thoroughly that researchers and providers have virtually forgotten why common practices exist.

In this paper, we briefly review the history of the research and practical program of the cognitive and behavioral therapies (CBTs). Both the cognitive and behavioral wings of CBT began with a person-specific process orientation, which has once again become a central focus as the idea that mental disorder can be classified into distinct, discrete categories has been largely disproved. This transition has been fostered by the so-called "third wave" of CBTs, which has raised a number of new underlying processes of change.

The field appears to be ready to move toward person-focused, evidence-based care models that target core change processes based on testable theories instead of latent disease entities that are moved by evidence-based intervention protocols. If we recognize the opportunity this moment presents, an alternative analytic agenda is available that can help our field, broadly defined, to address its central purpose more effectively.

THE LATENT DISEASE MODEL OF PSYCHIATRY

In traditional psychiatric nosology, the individual's presenting problems and observable characteristics are organized into the "syndromes" that define his/her mental disorder. A syndrome is a set of signs (things the practitioner can see) and symp-

toms (things people complain about) that tend to co-occur. As a set, they are seen as the possible expressions of a latent disease. In other words, it is assumed that people likely share the same syndrome because these sets of signs and symptoms are produced by the same underlying etiological causes, expressed in a characteristic mechanistic course over time, that can be altered in known ways. This is reflected in our everyday language. For example, we often say that a person "has depression" or that she is "suffering from an anxiety disorder", just as somebody "has the flu" or "is suffering from diabetes".

A syndromal strategy is topographical (in the sense that formal differences are its proximal focus), but its purpose is functional. The hope is that a focus on signs and symptoms will ultimately lead to useful categories that will "carve nature at its joints" (a phrase that has been attributed to Plato) by revealing disease entities with known processes of origin, development, maintenance and change. If these can be identified, treatments can then target these underlying disease processes in an increasingly effective manner.

The "clinical utility" of diagnostic categories is the pragmatic end state that in principle validates the entire nosological enterprise. The DSM-5 is clear about this ultimate goal: "The diagnosis of mental disorders should have clinical utility: it should help clinicians to determine prognosis, treatment plans, and potential treatment outcomes for their patients"[6]. The assumption on which this strategy is based, however, is that collections of signs and symptoms reflect similar latent disease processes. If such processes exist but can lead to a myriad of forms, or a myriad of processes can lead to similar forms, the syndromal strategy to reach clinical utility will likely fail, because in such cases topography is poorly linked to underlying processes. If processes of change are normal, they likewise cannot be adequately construed as diseases, latent or otherwise. Aging, for example, is not itself recognized as a disease, even though many processes of aging are known.

Earlier versions of the DSM pursued models of latent disease processes more directly by adopting theories and principles that were popular at the time, and then linking categorization to those ideas. The first two editions of the DSM were heavily grounded in psychoanalytic theory. Until the DSM-III, it was assumed that mental disorders would be shown to be rooted in deep-seated conflicts that needed to be identified and resolved. At a meta-theoretical level, this view was fully consistent with a latent disease model.

Recently, psychodynamically-oriented clinicians have attempted to resurrect this strategy with the notion that personality disorders are at the core of all mental disorders. To complement the DSM, psychodynamically-oriented clinicians developed the Psychodynamic Diagnostic Manual (PDM-2)[7]. The goal is to describe people regarding their personality characteristics, the adequacy of their mental functioning, and the patterns of symptom formation they may show, with particular attention to how they are experiencing these symptoms. The PDM-2 assumes that disorders are embedded in the client's personality structure and manifest in ways that vary with each person's functioning capacities. This too is fully consistent with a latent disease model.

THE ERA OF BEHAVIOR THERAPY

At the same time of the early days of the DSM, an alternative model had considerable impact. The first generation (or "wave") of behavior therapy targeted psychological problems largely based on the idiographic application of behavioral principles to specific cases. While agreeing that private events were legitimate targets of scientific analysis, Skinnerian behaviorism emphasized observable and quantifiable behaviors and their roles in altering the external environment, in part based on the belief that overt behavior, thoughts and feelings were all reflections of the same sets of overt contingencies. It was argued, for example, that the same aversive experiences could lead to fear, thoughts regarding that painful history, or overt attempts to escape or avoid[8]. All of these psychological actions were believed to be reflections of the same history and thus, while all were argued to be scientifically legitimate[8], there was no *requirement* to do the harder work of addressing private experiences over the analysis of overt action. Metaphorically, Skinner opened the door to a scientific analysis of thoughts and feelings but gave no reason to walk through it.

This "direct contingency" functional analytic approach still exists in classic applied behavior analysis, which today is largely deployed for children with developmental disabilities. Early behavior therapists and behavior modifiers also added neo-behavioral principles drawn from associative or social learning to Skinnerian operant principles in an attempt to understand human problems[8-15]. For example, theorists such as Bandura argued that problems could be based on the internalization of social norms or models[9].

For both of these wings of behavior therapy and modification (behavior analytic and neo-behavioristic), traditional diagnostic categories were abstract concepts with little known practical purpose. Instead, early behavior therapists believed that diagnosis should be linked to the individual application of scientifically well-established basic learning principles, leading to the selection of applied methods that were well-specified and empirically tested. This dual commitment is shown in Franks and Wilson's famous definition of behavior therapy as consisting of interventions linked to "operationally defined learning theory and conformity to well established experimental paradigms"[13].

The divisions that existed within behavior therapy at the time, especially between neo-behaviorism and behavior analysis, were papered over by their common frustration with the excesses of psychoanalytic thought and diagnostic strategies based on it. Eysenck and Rachman once put it this way: "There is no neurosis underlying the symptom, but merely the symptom itself. Get rid of the symptom… and you have eliminated the neurosis"[14]. Behavior therapists of all kinds took seriously the bottom line of changes in target behaviors, not a questionable and constructed disease entity[15]. Psychoanalytic fears of re-emergence of symptoms due to underlying conflicts[14] largely failed to materialize[16,17].

Many of the learning principles that were being applied had been identified

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through intensive laboratory analysis of small numbers of human or non-human subjects. This origin made it particularly easy for either wing of behavior therapy to maintain its focus on the clinicians' natural analytic agenda: application of knowledge to specific individuals with the purpose of creating analyses and treatment plans that would improve their outcomes. Early behavior therapy was always highly person-focused. Consider, for example, G.L. Paul's formulation of one of the most widely cited questions to guide psychological intervention researchers: "What treatment, by whom, is most effective for this individual with that specific problem, under which set of circumstances, and how does it come about?"[18].

This question encouraged clinical researchers to embrace a new scientific approach to therapeutic intervention. Specifically, Paul's question was intended to guide the field toward empirically supported treatments for specific psychological problem areas that fit the needs of the individual based on known processes of development, maintenance and change. Unlike traditional psychiatric nosology, no assumption of latent diseases was made – the processes involved might be relatively normal and only their combination or contextual sensitivity may be pathological. Despite these differences in assumptions, it should not be missed that, at a deeper level, there was a shared interest in the identification of clinically useful sets of processes that explained the origin, development, maintenance and change of human suffering.

Franks and Wilson's definition of the field shows how heavily the early days of behavior therapy relied on learning principles in a narrower sense, especially those drawn from the animal laboratory[13]. That emphasis contained a strategic assumption that the behavioral principles which applied to non-human animals comprised a relatively adequate beginning set from which to construct functional analyses that explained human suffering and human prosperity.

Well-developed theories of human cognition and emotion were only just forming, but, by the late 1970s, the limitations of a direct contingency approach caused attention to turn to them. Just as behavior therapy began to open up to a wider range of processes that might account for psychopathology, however, the DSM-III system and the funding stream it released began to capture the attention of CBT researchers and treatment developers. This had a significant impact on the strategic vision of the tradition.

THE "SECOND WAVE" OF CBT

Of all psychological treatment approaches, CBT aligned itself most closely to the psychiatric nosology of the DSM/ICD, even though the tradition from which it came was idiographic and process-focused, without any assumption of latent diseases. This dialectic is still the source of considerable controversy within CBT today.

The core premise of the second era (or "second wave") of CBT, as pioneered by A.T. Beck and A. Ellis among others, held that maladaptive cognitions contribute to the maintenance of emotional distress and behavioral problems[19,20]. According to Beck's model, these maladaptive cognitions include general beliefs, or schemas, about the world, the self and the future, giving rise to specific and automatic thoughts in particular situations[19]. The basic model posits that therapeutic strategies to change these maladaptive cognitions lead to changes in emotional distress and problematic behaviors.

The cognitive approach allowed for alternative interpretations of biological models, but a strength in the era of DSM was that they could be aligned with the medical illness model. CBT followed psychiatry by designing specific protocols for syndromes to be tested in randomized controlled trials. Mechanism and process research became somewhat of an afterthought. CBT protocols became increasingly specific, targeting specified DSM syndromes in line with the latent disease model.

A case in point is the story of panic disorder. The original conceptualization of this diagnosis was based on a medical disease model assuming the existence of distinct and mutually exclusive syndromes with an inherently organic etiology and specific treatment indications[21,22]. D.M. Clark introduced his cognitive model by referring to biological studies when he wrote: "Paradoxically, the cognitive model of panic attacks is perhaps most easily introduced by discussing work which has focused on neurochemical and pharmacological approaches to the understanding of panic"[23].

Clark's model conceptualized panic attacks as a consequence of the catastrophic misinterpretation of certain bodily sensations, such as palpitations and breathlessness[23]. An example of such a catastrophic misinterpretation would be that of a healthy individual perceiving palpitations as evidence of an impending heart attack. The vicious cycle of the cognitive model suggests that various external (i.e., a supermarket) or internal (i.e., body sensations or thoughts) stimuli trigger a state of apprehension if they are perceived as threatening: "For example, if an individual believes that there is something wrong with his heart, he is unlikely to view the palpitation which triggers an attack as different from the attack itself. Instead, he is likely to view both as aspects of the same thing – a heart attack or near miss"[23].

This model assumed that biological variables may contribute to an attack by triggering benign bodily fluctuations or intensifying fearful bodily sensations. Therefore, pharmacological treatments can be effective in reducing the frequency of panic attacks if they reduce the frequency of bodily fluctuations which can trigger panic, or if they block the bodily sensations which accompany anxiety. However, if the patient's tendency to interpret bodily sensations catastrophically is not changed, discontinuation of drug treatment is likely to be associated with a high rate of relapse.

In broad terms, this model has empirical support, and cognitive content is indeed known to impact syndromal signs and symptoms[24]. For example, panic patients who were informed about the effects of CO_2 inhalation reported less anxiety and fewer catastrophic thoughts than uninformed individuals[25]. Furthermore, panic patients who believed that they had control over the amount of CO_2 they inhaled by turning an inoperative dial were less likely to panic than individuals who knew that they had no control over it[26]. The cog-

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nitive package that was deployed for panic disorder based on these cognitive ideas was easy to standardize and manualize, and there was relatively less need to link specific treatment components to specific individual functional analysis.

More detailed and methodologically adequate research on precisely how change happens was put off to another day and, as a result, CBT packages became more focused on syndromes than processes. Because of diminished need for precision, there was less of an effort to weed out unclear, inconsistent, and even contradictory theoretical and philosophical positions. The golden era of "protocols for syndromes" settled in, with a huge rise in CBT research and funding for CBT laboratories.

Close to 300 meta-analytic studies have examined CBT for a large range of DSM-defined problems, with the strongest support for anxiety disorders, somatoform disorders, bulimia, anger control problems, and general stress[27]. There is much to be proud of in this body of work. With its efficacy proven in many randomized controlled trials, often in comparison to the most effective medications, CBT helped countless people and saved many lives. This has led to the implementation of cost-effective health care policies in many developed countries around the world.

At the forefront currently is the UK initiative called Improving Access to Psychological Therapies (IAPT)[28]. This program has been highly successful: not counting dropouts and refusals, about one in two individuals using an IAPT program for depression, anxiety or other mental health problems recover, and as many as two in three show considerable improvements[29]. At the same time, the relative strength of outcome evidence allowed the assumption that the role of cognitive and emotional content is determinative in psychopathology to cover the open questions about the processes of change underlying CBT strategies. Given the relative success and body of evidence for CBT, these open questions seemed to be a small price to pay.

In the context of the hegemony of syndromal diagnosis, increasingly narrowly focused interventional packages and protocols were assembled within CBT. These fostered ever more fractionated domains of expertise and led to difficulties for students and professionals to consider the progress of the field in a fully cohesive fashion.

THE "THIRD WAVE" OF CBT

Underneath the surface, a set of concerns gathered in the late 1990s and early 2000s, that began to shine a light on the need for both theoretical and philosophical development within the behavioral and cognitive tradition. These included empirical issues such as the unexpected relative success of more narrowly focused and overtly behavioral methods in comparison to full CBT protocols, such as modern forms of behavioral activation in the treatment of depression[30]; the unexpected results from large component analysis studies of CBT[31,32] in which cognitive components were not found to be key to outcomes; and the unexplained response to CBT protocols in early sessions, before putatively critical elements within the model were presented[33]. They also included inconsistent evidence of change processes using measures derived from traditional theoretical models[34,35]. In all of these areas there were counterarguments to be made[36], but the point is that matters that were considered well-settled within CBT were now unexpectedly under scrutiny.

At the same time, the dominance of elemental realist (or "mechanistic") assumptions were challenged by well-known CBT researchers who took a more functional and contextualistic philosophical stance[37,38]. Most traditional CBT models assumed that psychopathology and its treatment could be thought of as being the result of sets of parts, relations and forces that were ontologically preexisting, and thus needed to be modelled much as a machine would be modeled by a construction diagram. In contrast, some CBT researchers began to embrace constructivist assumptions – a more purely descriptive form of philosophical contextualism[38,39] in which the very nature or meaning of events could only be appreciated in their historical and situational context, and in the light of the purposes of scientific analysis itself.

It gradually became clear that some differences within the family of CBT interventions reflected differences in *a priori* assumptions and philosophy of science in such areas as units of analysis or truth criteria[37]. For a contextualist, abstraction of a psychological action required understanding and appreciation of its history and purpose, because the unit of analysis was always the "act-in-context". For an elemental realist, an action and its nature could seemingly be appreciated alone and apart, much as a part taken from a dissembled machine can be examined while sitting on the kitchen table. For instance, for a mechanist, "anxiety" could be viewed as a negative emotion based on its form, frequency or intensity; for a contextualist, across a wide range of forms, frequency or intensity, anxiety could be said to function negatively or positively with reference to its context of occurrence[40].

These different foundational assumptions of "third-wave" CBT methods penetrated the clinical methods they produced and led to a rapid rise of new processes of change that focused on the *function* of cognition and emotion, over and above their form *per se*. For example, instead of trying to change the form, frequency, or situational sensitivity of so-called "negative" emotions or thoughts, as might be done in traditional CBT, "third-wave" methods more frequently targeted the relationship of the client to his/her own experience. A variety of process-oriented models and sets of methods emerged within "third-wave" CBT, including dialectical behavioral therapy (DBT)[41], mindfulness-based cognitive therapy (MBCT)[42], meta-cognitive therapy (MCT)[43], functional analytic psychotherapy (FAP)[44], acceptance and commitment therapy (ACT)[45], modern forms of behavioral activation[46], and several others[47].

The initial shock of the "third wave" has now passed[37,47]. CBT is currently a broader umbrella term that includes different philosophical assumptions, targeted processes, intervention approaches and philosophies, living side by side. The more traditionally behaviorally oriented treatments place a greater emphasis on history and context as it bears directly on overt action. The more cognitively oriented treatments share the basic premise that mental disorders and psychological distress are

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maintained by cognitive content. "Third-wave" methods come from both of these wings, but all focus on the person's relationship to his/her own experience.

The amount of research now available on "third-wave" methods is so extensive that it is not possible to characterize it adequately via individual studies, nor even via individual meta-analyses. Just in the area of ACT, there are currently over 420 randomized controlled trials[48] and about 80 meta-analyses[49], covering a wide variety of topics, from mental health to physical health, sport, social change, and high performance.

Some of the "third-wave" methods are as good in terms of outcomes as gold-standard traditional CBT, but research has shown that such a "horse race" question is the wrong one to ask, because different moderators predict different outcomes. Just as one cannot focus on main effects statistically when significant interactions are found, so too it is simply wrong to compare packages in an overall fashion when moderation is regularly present.

Consider for example a series of studies from M. Craske's laboratory at University of California, Los Angeles (UCLA) comparing traditional CBT vs. ACT in people with anxiety disorders. In a study of CBT-based exposure versus ACT-based exposure[50], the focus on "which package is better" initially suggested that ACT was superior on blind clinical ratings from post-treatment to follow-up. Studies soon followed, however, showing that this conclusion would be misleading, because moderation analyses showed a more complex picture. For example, those with anxiety issues alone did better with traditional CBT, while those with both anxiety and depression issues did better with ACT[51]. Several additional studies by the same team identified other significant moderators: for example, in a group of mixed anxiety disorders, ACT was better for those with initial high levels of behavioral avoidance[52], while CBT was better for persons with social phobia if they had very high levels of initial psychological inflexibility[53].

In the context of regular patterns of significant moderation, a question such as "which is better" between "second-wave" and "third-wave" CBT is scientifically and clinically nonsensical. Rather, the moderation results suggest that evidence-based therapists need to know about both types of models and methods.

The second shoe to hit the ground, after regular findings of moderation between various CBT methods across eras and "waves", has been a series of studies showing that the functionally important processes of change identified through mediational analysis sometimes differ and sometimes do not between these intervention methods. Furthermore, these mediational findings do not always line up as expected.

We can stay with the series of studies from UCLA to make this point. In a study on the treatment of social anxiety disorder with either ACT or traditional CBT, rapid decreases in negative cognitions at the beginning of treatment mediated outcomes in both interventions, but an early rapid decrease in "experiential avoidance" (the tendency to avoid difficult private experiences) was a change mechanism specific to ACT[54]. Cognitive defusion (i.e., the ability to experience thoughts with a sense of distance from them, so as to diminish their automatic behavioral impact) mediated worry, behavioral avoidance, and quality of life outcomes in both conditions, but more strongly predicted worry reductions in CBT than in ACT[55].

This same pattern of distinction and overlap has been shown in several studies that have examined the functionally important pathways of change in CBT across eras and "waves". For example, cognitive defusion appears to mediate depression outcome for ACT more than for CBT[56], while outcomes of traditional CBT for chronic pain are mediated by pain acceptance, even though this is not deliberately targeted by traditional CBT protocols[57]. In a multidisciplinary, multicomponent, group-based CBT program for adults with chronic pain, pre-treatment measures of psychological flexibility (the core process target of ACT) predicted ultimate outcomes, and change in each of the aspects of psychological flexibility measured in the study (acceptance, cognitive defusion, values, committed action) separately mediated outcomes[58].

Results such as these have caused a major move toward treatment competencies and processes of change in CBT. It makes little empirical sense to focus on packages for syndromes if the actual sequence of psychological changes that are functionally important to outcomes are not necessarily the putative mechanisms favored by intervention developers and can be moderated by such processes in unexpected ways. Traditional CBT developers might be a bit startled to see that pain acceptance mediates outcomes in chronic pain, despite the fact that it was never targeted explicitly by the therapy they developed[57,58]. Similarly, an ACT developer might be puzzled to see that very high initial levels of experiential avoidance in persons with anxiety problems might suggest the use of traditional CBT over ACT, even though that has always been a key target of ACT but not traditional CBT[53].

A consensus building process launched by the Association for Behavioral and Cognitive Therapies is a clear example of this change in focus within CBT. This association brought together more than a dozen professional societies to develop guidelines for integrated education and training in cognitive and behavioral psychology[59]. Among their recommendations were the key ideas that modern CBT needs to include clarity about philosophical assumptions; understanding of processes of change; the ability to fit intervention methods to the needs of individuals; and competency in delivering a wide variety of helpful kernels across the various CBT wings, eras and "waves".

The lurching quality of "waves" comes from shifts in organizing assumptions that are too narrow: "processes of change can be drawn heavily from non-human animals", followed by "no, cognitive content is key and is left out by that", and then "no, the relationship to experience is key and is left out by a focus on content". All of those assumptions contain some truth, but all are too limited for a mental health field-wide effort to change the trajectory of evidence-based care. For example, all of these strategic assumptions in the generations of CBT under-emphasize genetic, epigenetic and neurobiological processes, or the sociocultural processes, that are involved in human functioning.

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The slow progress of evidence-based intervention science, when measured against the magnitude of human needs[60], demands an end to excessively narrow strategic assumptions that cause the field of mental and behavioral health to lurch from one oversimplification to another. While useful knowledge has emerged from each of these eras, it is time to focus on a set of organizing principles that will allow what is most important in our knowledge base to be used by all researchers and practitioners interested in evidence-based care. For that to happen, we need to reconsider what evidence-based care even is.

An integrative cycle has begun that we argue may be able to carry not just CBT forward, but the entire field of evidence-based intervention science. Due in part to the churn of issues raised by "third-wave" methods, modern CBT has recently seen an enormous increase in studies on processes of change, especially in the form of studies on treatment moderation and mediation. Taken together, these findings lay the foundation for a new way forward.

THE "THIRD WAVE" AND PROCESSES OF CHANGE

When the "third wave" of CBT was proposed, it was in recognition of changes that were happening in all of the CBT wings at the time[35]. Five key features were underlined[61]. Much in the same way that cognitive methods were assimilated into behavior therapy as a larger evolution of the tradition, virtually all of these changes have been assimilated over the last 15 years into the core of CBT writ large. They are worth reviewing because they arguably help form the foundation for the process-based change that is now occurring.

A focus on context and function

The newer methods of CBT have virtually all focused on principles of change that deal more with the context and function of psychological events (e.g., thoughts, feelings, and overt action) rather than their content.

From the cognitive wing, examples of this change include MBCT ("unlike CBT, there is little emphasis in MBCT on changing the content of thoughts; rather, the emphasis is on changing awareness of and relationship to thoughts"[62]), and MCT ("MCT does not advocate challenging of negative automatic thoughts or traditional schemas"[63], because while "CBT is concerned with testing the validity of thoughts… MCT is primarily concerned with modifying the way in which thoughts are experienced and regulated"[63]).

In more behaviorally rationalized methods, examples of this change include modern behavioral activation (in which "interventions address the function of negative or ruminative thinking, in contrast to cognitive therapy's emphasis on thought content[30]"), and ACT (in which "the model points to the context of verbal activity as the key element, rather than the verbal content; it is not that people are thinking the wrong thing – the problem is… how the verbal community supports its excessive use as a mode of behavioral regulation"[64]).

The view that new models and methods should build on other strands of CBT

It is the job of a progressive field to carry everything that is useful forward as the field develops. In the case of "third-wave" models, this was described as a core commitment to "transformation of these earlier phases into a new, broader, more interconnected form; thus, while the implications may be revolutionary, the processes giving rise to these developments are evolutionary"[37].

The newer methods of CBT have taken that idea to heart, and well-tested processes and kernels have been included as steps forward were taken. Methods such as exposure, skills training, self-monitoring and behavioral homework were nearly universally included. The larger framework of CBT did change, however, as these processes were assimilated. For example, exposure is now more about values-based new learning than about emotional habituation *per se*. Similarly, rather than using it to challenge and change specific thoughts, thought recording is for decentering or defusion purposes – noting thoughts so as to reduce their automatic impact. Likewise, cognitive reappraisal is now focused more on cognitive flexibility and the utility of a variety of available constructions rather than on noticing and eliminating most or all cognitive errors.

A focus on broad and flexible repertoires vs. signs and symptoms

It is characteristic of the more recent methods that they have been relatively broadly focused. That is evident in the scope of their application and the breadth of their processes of change. The flexible and functional attentional focus of MCT, the values work of ACT, the emotional regulation skills of DBT, the present focus of MBCT, can apply to virtually any life situation, not just narrowly conceived clinical pathology.

In part as a result, a focus on specific syndromes has rapidly broken down in the last 15 years of CBT development, and that in turn has set the stage for the transition we are suggesting is taking place to a process-based model of evidence-based intervention. CBT is rapidly becoming so "transdiagnostic" that even that term is no longer adequate. Indeed, "third-wave" CBT seems to have particular affinity for issues of resilience and positive growth, as much as the alleviation of problems[65].

Applying processes to the clinician, not just the client

Almost all of the newer methods of CBT take time to apply intervention to the practitioner, not just the client. In DBT, the task "is to apply the therapy to one another, in order to help each therapist stay within the therapy protocol"[41]. In MBCT, "perhaps the most important guiding principle is the instructor's own personal mindfulness practice"[66]. In FAP, "in order to best attend to the client's experience, therapists first need to be in touch with their own"[67]. In ACT, "there is no fundamental distinc-

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tion between the therapist and the client at the level of the processes that need to be learned"[68].

In part, this is because the methods are arguably more experiential, and there is the belief that you cannot teach what you cannot do. The other part of the picture is that these methods are based more on how normal psychological processes can occur in ways that produce psychological harm, and how these processes can be rearranged to promote greater human prosperity. Empirically, that idea has been borne out by evidence that "third-wave" methods lead to positive psychological outcomes for practitioners and trainees, not just their clients[69].

Expanding into more complex issues

The newer forms of CBT have not hesitated to try to address a wide variety of complex human issues historically more characteristic of humanistic, existential, analytic, or system-oriented approaches than CBT. For example, ACT addresses issues of values and meaning making as might occur more in existential therapy, or of emotional openness and perspective taking as might occur in humanistic or Gestalt approaches. FAP focuses on the qualities of the therapeutic alliance and how to use them to build more supportive relationships, as might be expected in Rogerian psychology. DBT emphasizes interpersonal validation very much as might be done in humanistic approaches.

Indeed, although the theoretical concepts and ways of discussing these phenomena may differ, it would be hard to find any central issue in more depth-oriented clinical work that is still left fully outside of the CBT tradition when all of its generations, eras and "waves" are included. In a few cases this breadth is occurring because modern CBT is simply borrowing methods, but in the majority of these cases it is more that "third-wave" approaches are burrowing into issues that used to be ignored. ACT work focused on values choices, for example, is relatively unique technologically – while being deeply resonant in its focus to other traditions.

INTEGRATING THESE SENSITIVITIES INTO PROCESS-BASED CBT

As these core commitments have been given expression, a large body of evidence has emerged on processes of change. These can be defined as theory-based, dynamic, progressive, contextually bound, modifiable and multilevel mechanisms that occur in predictable, empirically established sequences oriented toward desirable outcomes[70].

These processes are theory-based in the sense that they are associated with clear scientific statements of relations among events that lead to testable predictions and methods of influence; dynamic because they may involve feedback loops and nonlinear changes; progressive because they may need to be arranged in particular sequences to reach the treatment or prevention goals; contextually bound and modifiable so that they directly suggest intervention kernels within the reach of practitioners; and multilevel because some processes supersede or are nested within others.

The literature on processes of change is vast. Much of this is in the form of mediational analyses. If only studies of mediation within randomized controlled trials are examined, more than 1,000 significant findings can be identified, encompassing more than 100 processes of change[71]. While the nomothetically-based pauci-variate, linear and unidirectional nature of mediation needs ultimately to be put aside in favor of idiographic complex network analysis[72], that literature provides an empirical foundation for the steps that are now called for in evidence-based care.

In what follows we summarize the literature on psychological processes of change in CBT, focusing largely on processes with mediational evidence. Our larger point is that, by their progressive work on processes and procedures, the eras and "waves" of CBT have built a foundation that now allows the entire mental health field to move beyond protocols that are focused on syndromal entities into a new, idiographic form of process-based functional analysis[73].

As we will emphasize, this step has indeed been advanced powerfully by the "third-wave" methods and models, and the strategic and assumptive features we have already reviewed, but, in a mature process-based approach, all empirically well-established processes and the intervention kernels that move them need to be included in evidence-based care regardless of origin.

Empirically speaking, psychological processes of change can be roughly organized into six dimensions, which we will consider in turn.

Cognition

The newer forms of CBT have added several processes of change in the dimension of cognition, but all of them focus on changing the relationship of thinker and thought. Particularly well-supported change processes from newer forms of CBT include cognitive defusion[74] (which is the ability to experience thoughts with a sense of distance from them, so as to diminish their automatic behavioral impact) and non-reactivity[75,76] (which is allowing cognitive or other experiences to come and go without reacting in an effort to change them). Both of these processes alter the impact of human cognition by changing the person's relationship to his/her own thoughts, rather than trying to change the form, frequency, or situational sensitivity of thought itself. As such, these are contextually focused processes, rather than being content focused – a key feature of many "third-wave" processes.

Our understanding of traditional more content-oriented CBT cognitive constructs, such as cognitive reappraisal[77], rumination and worry[78], catastrophizing[79], and dysfunctional thoughts[80], have also been impacted by these newer concepts. For example, it is not the mere appearance of worry that is considered negative so much as it is entanglement with worry. Similarly, it is not that reappraisal is a way to get to the "right thought" or to get rid of the "wrong thought", but rather that there are a variety of thoughts available to guide action and the client should notice and retain the

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more functional ones.

A consensus appears to be emerging that what is most needed is enough healthy psychological distance from thought, so that beliefs and cognitive constructions are not excessively entangling, either through avoidance and suppression, or attachment and rigid adoption[81,82]. In addition, what is needed is enough cognitive flexibility[81], so that an array of possibly useful constructions are available in a given situation and the person can learn what is most useful in that context.

Affect

The newer forms of CBT have added a variety of affective processes to those targeted by traditional CBT. These new concepts all focus on how the person relates to emotion, in such areas as the openness to affect, the willingness to deepen experience, and the importance of learning from emotional experience[62]. The most frequently supported is acceptance[82,84,85] – the willingness to experience affect without needless escape, avoidance or constraint. Far from resignation, acceptance implies an active embrace of experience and learning from the content of affective events. Other examples of newer affective processes are closely aligned with acceptance, including self-compassion or self-kindness[86], and distress tolerance[87].

The more content-focused concepts found in traditional CBT, such as positive and negative affect[88], loneliness[89] and hopelessness[90], are still important clinical guides, especially when excessive in frequency or intensity, but the newer processes expand on the clinical meaning of these affective contents. For example, negative affect has been shown to be most behaviorally harmful when it kicks off processes of suppression and avoidance[91]. When it does not, the capacity to notice and describe negative emotional experiences can predict positive clinical trajectories even in the presence of stressful emotions as defined by their mere form[92]. These positive trajectories may in turn reduce negative affect over time, and thus to some degree the traditional content-focused processes may also be long-term markers of the mismanagement of more contextual emotional regulation strategies.

Attention

Traditional CBT did not have a rich conceptual language for the regulation of attention, with the exception of a small number of concepts, such as rumination and worry, that are attentional as well as cognitive. In contrast, work on attention has been very dominantly evident in newer forms of CBT. Almost all methods of "third-wave" CBT include forms of mindfulness-based intervention or contemplative practice, and all of these methods thus include training in the flexible, fluid and voluntary control of attentional processes[61,93]. Such training can occur through contemplative exercises, deliberated training in attentional control, guided imagery, or other means of focusing on the now – shifting or persisting in attention, and broadening or narrowing in attention, as the situation demands.

Mindfulness interventions impact a broad collection of change processes that go far beyond attentional processes *per se*[94], and "mindfulness" as a term suffers from the wide varieties of measures and perspectives that reflect its diverse history of origin. Regardless, the link between attention and mindfulness is so strong that sometimes "mindfulness" is used as a virtual synonym for paying attention.

The centrality of this dimension is shown also by how these processes interact. For example, the shift from a focus on the content of thought to the process of thinking itself (as in cognitive defusion) is in part an attentional shift inside the cognitive domain. Similar statements could be made about the "third-wave" processes of change in affect, sense of self, or motivation.

Self

Self-regulation and self-management work began in the behavior therapy era[95], and continued in traditional CBT with concepts such as self-efficacy[96]. The "third wave" brought more spiritual senses of self into evidence-based care, through such concepts as an observing self or "self-as-context"[84], self-distancing[97], decentering[98], or a sense of spirituality[99].

These senses of self are not defined by evaluated content – indeed, in "third-wave" approaches, the conceptualized and evaluated self is commonly viewed as an unhelpful psychological process[84]. Rather, they refer to a sense of pure awareness or perspective taking, that affords or includes conscious experience, but is not defined by its content.

Of all the areas of development, this is perhaps the most empirically difficult, because these deeper senses of self are difficult to measure by self-report. A self that is defined by pure awareness is not so much an object of reflection as it is a marker of human consciousness *per se*[99]. Human consciousness is too central a topic in the history of psychology and behavioral science to avoid, but its complexity can hardly be overestimated. Nevertheless, studies have shown the relevance of these "third-wave" processes to outcome[100].

Motivation

Motivation was a key focus in early behavior therapy, especially in the form of reinforcement and goal setting. These processes are still of known importance[101], along with such traditional motivational concepts as intentions and expectations[102]. The newer forms of CBT, especially ACT, have added an emphasis on chosen values as a key mediator of change[84,103].

The embrace of values choices as a motivational process needs to be seen in the context of the other dimensions added by "third-wave" research and theory. For example, greater emotional awareness and openness itself informs values choices, as does greater cognitive and attentional flexibility.

Overt behavior

A number of targeted skills have emerged in modern CBT, but these are often focused on other processes. For example, DBT skills include methods of self-regula-

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tion mediating outcomes of the therapy in the area of suicidality[104]. ACT's focus on a commitment to the creation of patterns of values-based actions has some empirical support[105].

However, the majority of known behavioral targets have roots in early behavior therapy, such as restriction of safety behaviors, behavioral activation, problem-solving, social skills, planning, or reductions in impulsivity[106].

Cross-dimensional concepts

Several of the important psychological processes of change combine two or more of the above evolving dimensions. Self-regulation arguably involves both overt behavior and sense of self. Mindfulness involves affect, cognition and attention – and in some models a transcendent sense of self.

Perhaps the prime example of such clustered processes is psychological flexibility, which combines "third-wave" concepts in each of the six above dimensions, including emotional, cognitive and attentional flexibility, a perspective-taking sense of self, values as a motivator, and construction of overt behavioral patterns of values-based habits. Meta-analyses have shown that psychological flexibility is a common mediator of psychological change especially with "third-wave" interventions such as ACT[107,108].

Processes of change at other level of analysis

It is not possible to move to a process-based era staying entirely at the psychological level. At the bio-physiological level, for example, changes in brain connectivity have already been shown to mediate the impact of some cognitive interventions. It is also known that processes of change such as emotional acceptance are themselves mediated by the connectivity strength between brain areas known to relate to difficult emotional responses[109]. Biologically relevant behavior change is also known to be important in such area, including diet, exercise and sleep[110,111].

In an increasingly diverse world, processes at the socio-cultural level also cannot be forgotten. Social processes that can vary between cultural groups, such as forms of social support, or styles of family functioning, are known empirically to mediate outcomes[112]. Socially focused processes from modern CBT are also important, including such issues as interpersonal compassion, perspective taking, prosociality and empathy[86]. A more controversial but important focus is the therapeutic alliance, which mediates outcomes across a variety of psychosocial interventions, but which also appears to have its impact in part because it promotes internalization of psychological processes of change such as acceptance, non-judgment, or maintaining a values focus[113,114].

ANALYZING PROCESSES OF CHANGE

Processes of change need to be studied in a way that is consciously "idionomic" – i.e., that uses idiographic analysis for ultimately nomothetic purposes[72,115-117]. This approach encourages the clinician to examine the functional connectivity between the various problems the client experiences and the situations in which they occur, emphasizing the use of processes of change to characterize the development and maintenance of the client's difficulties and the limitations on his/her growth.

For example, a person may respond to historically produced social anxiety with social withdrawal in the service of avoiding feelings of inadequacy. Once we understand the functional connections, we can try to modify his/her maladaptive network by establishing greater emotional openness, or increasing the likelihood of compassionate social connection. Another person with very similar historically produced social anxiety may attempt to control negative social outcome by greater vigilance to social threats, and increased rumination and worry. That person may need work in increasing attentional control and training in reappraisal skills so as to dampen ruminative cognitive habits. These cases identify treatment relevant functional analytic patterns that incrementally add to the idionomic research base of process-driven complex network analyses of psychological problems.

The idea of moving away from treating psychiatry labels toward treating the individual patient by understanding the process-based complexity of his/her problems and applying tailored intervention strategies is not new. The use of functional analysis and case formulation is at the core of the behavioral tradition[73,115], but an empirical complex network approach based on ecological momentary assessment data drawn from the last 40 years of process-based research is a substantial expansion, elaboration and further development of this early tradition. In addition, it provides a heuristically valuable model for a treatment-relevant classification system that is based on treatment processes.

We have identified the steps needed in such a process-based form of functional analysis[73]. Unlike classical functional analysis, the steps begin with the consideration of the features of the case in terms of possible complex network formulations, identification of possible change processes within the network, and collection of higher temporal density longitudinal measures to build out the network empirically. Relevant treatment kernels can then target the key elements of the client's empirical network of experiences, actions, bio-physiological, socio-cultural, and situations features, that indicate key processes of change idiographically over time. If the processes are altered in an expected direction, treatment can continue, and outcomes be assessed – which, if successful, then allow idiographic patterns to be identified and sorted into nomothetic grouping, provided the individual pattern need not be distorted to do so. If targeted processes do not change, or expected outcomes do not follow, the cycle of process-based functional analysis could be restarted.

Studies have already suggested the empirical superiority of deploying evidence-based treatment modules or kernels to target person-specific maladaptive processes of change, over global protocols targeting global syndromes[118,119]. Over time, this recursive idionomic process-based functional analytic strategy would build a

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body of empirical nomothetic categories with known treatment utility[120-122].

The field still would have to systematize this growing body of findings over time in a clinically accessible way that is not theoretically narrow. That is a tall order, but it does not seem to be beyond our reach. Indeed, we have already proposed such a system based on an extended evolutionary account[123].

CONCLUSIONS

As the controversy over the "third-wave" passes into the rear-view mirror, contemporary CBT has become broader, more flexible, more philosophically responsible, more process-focused and more committed to fitting treatment methods to the needs of people. Data have increasingly emerged that reveal the wisdom of a process approach[61] as it applies to the understanding of traditional and newer-wave CBT methods.

This does not argue that therapists can be merely eclectic, because different models may rely on contradictory philosophical assumptions and theoretical concepts. Rather, therapists need to know how to identify and target central processes of change in a manner consistent with their underlying evidence. This can only fully happen if the field at large moves in a process-based direction.

All of the strategic approaches to evidence-based interventions have an ultimate purpose of understanding the processes that account for the origin, development, maintenance and change of adaptive or maladaptive human functioning. The assumption that mental problems reflect the expression of a latent disease entity has dominated psychiatric nosology, with the distinction being one of tactics, whether it is using psychoanalytic principles as in the early days of the DSM, or identifying syndromes, or developmental neurobiology as in the case of the Research Domain Criteria[124].

This assumption appears to be inhibiting the effective search for processes of change and has significantly altered modern culture in dangerous ways. Consider people in the US who sought treatment for psychological struggles during the years from 1998 to 2007 (the most recent decade with studies having reliable sample sizes). In that time, the number of people using only psychosocial change methods to address their problems fell by nearly 50%, while the number of those persons using psychological approaches along with medications fell by about 30%. What shot up? People using only medications. By 2007 more than 60% of people with psychological conditions were using medication *alone*[125]. There is no body of science that could justify such an unintended outcome of a latent disease construction. Indeed, global health specialists point out that, when this construction enters into the developing world, care can deteriorate rather than improve[126]. A new way forward is needed.

Intervention science has arguably reached a tipping point as a new process-based paradigm is emerging[70]. This paradigm is questioning the biomedicalization of human psychological suffering due to its poor validity and clinical utility. The field appears to be ready to move toward person-focused, evidence-based care models that target core change processes based on testable theories, instead of latent disease entities that are moved by evidence-based intervention protocols.

We believe that a process-based approach represents a paradigm shift in intervention science. The time is ripe for modern psychotherapy and intervention science to focus on a new foundational question that may be viewed as an expanded version of G.L. Paul's original question: "What core biopsychosocial processes should be targeted with this client given this goal in this situation, and how can they most efficiently and effectively be changed?"[18].

Process-based therapy (PBT) is not a name for a new therapy – it is a name for a new approach to evidence-based intervention science that uses contextually specific and evidence-based processes in order to alleviate the suffering and promote the prosperity of people. In contrast to the protocol-for-syndromes approach, PBT targets theoretically derived and empirically supported processes that are known to be responsible for positive treatment change, thus ensuring the treatment utility[127] of the approach.

PBT marks an era that is more open, theoretically coherent, philosophically clear, broadly focused, and idiographic. In some ways this represents a throw-back to earlier days in CBT, but it is occurring now with new concepts, measures, empirical approaches and analytic methods. Like a walk up a spiral staircase, we cover previous ground, but in a more advanced position.

Many of these changes were greatly amplified by the arrival of the "third wave" of CBT, but, for the sake of long-term progress, it is important that the field not stay there. All of the "waves" and eras of CBT, psychiatry, and evidence-based interventions more generally, have a place and a role in the future that is unfolding. Identifying processes of change has been the implicit agenda of intervention science from the beginning – it is time to make that agenda the explicit core of our field.

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