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Towards an Understanding of the Process and Mechanisms of Change in Cognitive Behavioral Therapy: Linking Innovative Methodology with Fundamental Questions [Editorial]

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Editorial

Towards an Understanding of the Process and Mechanisms of Change in Cognitive Behavioral Therapy: Linking Innovative Methodology with Fundamental Questions

There is now consistent evidence to support the efficacy of cognitive-behavior therapy (CBT) to reduce clinical symptoms and improve quality of life across a variety of clinical problems (Butler, Chapman, Formen, & Beck, 2006). This outcome research typically relies on a pretreatment-posttreatment design and follow-up assessments at fixed intervals beyond post-test. These outcome studies have been important in answering questions about *if* a treatment works and, to some extent, *for whom* it works. However, these designs provide much less information about the mechanisms of treatment—*why* or *how* an intervention works. There has been a resurgence of interest in studying what happens between the pretreatment and posttreatment assessment–the process of change–and a recognition of the important role of this research in treatment development.

In a series on guidelines for treatment development, Rounsaville, Carroll, and Onken (2001) and Kazdin (2001) recommend that new treatments be modified incrementally, using research that identifies the key elements of the new treatment and the processes related to outcome. Because therapy process research can be so labor-intensive, designs often involve only a few randomly sampled sessions in a course of therapy, an early and late session, or high impact sessions. Recently, researchers are making more use of longitudinal methods to reveal important processes and mechanisms of change. These studies include more frequent assessments, the study of individual trajectories over time, and the identification of discontinuities and nonlinear patterns of change. Process researchers are also moving beyond the study of the individual, couple, and group to the study of larger units, such as communities of participants and therapists. This new wave of research has the potential to map the process of change in successful CBT. Such a "map" would have several important implications, including (1) further refinement of existing treatment procedures; (2) a clearer picture of the processes of recovery, treatment dropout, poor response, and relapse; and (3) the development of new therapeutic techniques that more specifically activate the mechanisms by which clinical changes occur.

We invited authors in this series to present new theoretical developments and cutting-edge research methods for studying the process of change across a range of disorders. Because statistical innovations are such an important aspect of this work, the first paper by Laurenceau, Hayes, and Feldman addresses methodological and statistical issues to consider in the analysis of change. This paper sets the foundation for the series in that a number of the contributors apply the design and analyses recommended. Laurenceau et al. recommend that psychotherapy researchers increase the precision with which they study change by including frequent assessments of symptoms and of the putative mediators or covariates of change over the course of treatment and follow-up period. They also recommend that researchers carefully consider the timing of the effect of an intervention so that hypotheses about temporal sequencing can be tested. Individual growth curve modeling is described as a method that can be used with longitudinal data to model trajectories of change over time. They describe briefly growth mixture modeling as a way to group patterns or classes of trajectories. The authors introduce dynamical systems modeling, which can have application in psychotherapy research when samples sizes are large and assessments are frequent. This approach, which allows for the study of oscillations and nonlinear fluctuation in variables is just starting to be applied to psychotherapy research.

The next three papers illustrate how some of the methodological and statistical innovations presented in the Laurenceau et al. paper can be applied to different areas of process research: the course and treatment of schizophrenia, discontinuous and nonlinear change in psychotherapy, and the process of

relapse in substance abuse. Peer, Kupper, Long, Brekke, and Spaulding describe how cross-sectional designs are inconsistent with theoretical models of the dynamic and fluctuating course of schizophrenia. Schizophrenia is a disorder that has a course characterized by periods of symptom stability and fluctuation and that is punctuated by periods of rapid decline and psychotic episodes. Understanding change requires a broad perspective, given the chronicity of the disorder, the range of relevant biopsychosocial variables, and rehabilitation efforts that involve multiple levels of intervention (e.g., individual, group, and community-based). Peer et al. review studies that use growth curve and time series analyses to study the shape and timing of recovery and how changes in one domain of functioning influence and covary with other domains.

Hayes, Laurenceau, Feldman, Strauss, and Cardaciotto present a paper on designs to study individual time course data that can reveal a type of change that is discontinuous and nonlinear. Although most clinical trial designs assume gradual and linear change, these authors describe a different sort of change characterized by disturbance and transient periods of apparent worsening. They review examples from research outside of clinical psychology, such as dynamical systems theory in developmental and social/personality psychology and research on post-traumatic growth and life transition. These authors then review research on anxiety disorders, depression, personality disorders, and substance abuse that reveal similar nonlinear patterns of change. They use these studies to illustrate how discontinuities in individual time course data can point to segments of therapy that can reveal potentially important processes of change.

The process of relapse after recovery has also been characterized by assumptions of gradual and linear change. In addition, most designs infrequently assess functioning after treatment and instead examine the maintenance of treatment gains at fixed intervals of three to six months. In a thought-provoking review, Witkiewitz and Marlatt present studies that suggest a sudden and discontinuous fall from recovery to relapse. They describe how cusp catastrophe models and methods can be used to study the process of relapse in substance abuse. Their research suggests that these nonlinear models provide a better fit to the data than more traditional linear models. They also review proximal and distal predictors of relapse within this context.

The next paper by Prinz and Sanders takes us outside of therapy room and into the community to study how a population-level approach to parenting and family support may help to prevent child maltreatment. They highlight the prevalence of child behavioral and emotional problems coupled with the insufficient dissemination and access to evidence-based treatments and preventive interventions for children and families. They move away from the more traditional focus on the individual and family and toward a public health perspective, which emphasizes population-wide strategies to reach larger segments of the population and optimize impact. This perspective yields a different type of data than traditional psychotherapy research in that the community and its practitioners are the units of interest rather than the individual, family, and therapist units that more often studied in clinical psychology. The study of change also moves to a different scale in that the focus is on large-scale change in access to treatment and the process by which the population-based interventions might decrease risk. In other words, the authors illustrate how therapy process research can be significantly broadened in scope to study the process of change in dissemination and prevention efforts. The authors describe a prevention trial from their own work that illustrates a population-based approach in action. This program aims to strengthen parenting, reduce risk for child maltreatment, and reduce the incidence of early child behavior problems.

We end the series with an overview by McNally of our understanding of the process of change in exposure-based therapies for anxiety disorders. The treatment of anxiety disorders with these therapies has been one of the success stories in clinical psychology. In addition, researchers in this area have provided a model of how process and outcome research can be used iteratively to improve treatment efficacy. As the authors in this series have illustrated, change is a dynamic process, and there comes a time when challenges to an existing system push for change and new developments. McNally astutely argues that new data from neuroscience challenge some facets of the earlier theories of change in

exposure-based treatments and have led to refinements in our understanding of anxiety and the process of changing it. McNally also presents provocative new research from neuroscience that he contends has the potential to improve further the efficacy of our treatments for anxiety disorders. This paper illustrates the healthy process of using new information to expand current ways of thinking.

Pachankis and Goldfried are in a unique position to place the papers in this series in historical context and to discuss the future of process research, considering also its impact on the practice and delivery of services. Goldfried has been at the forefront of psychotherapy process research and has long called for researchers to search for *principles of change*. This call is as relevant now as it was almost two decades ago. Pachankis and Goldfried again underscore the importance of identifying principles of change that are more broadly applicable than specific treatment packages for DSM diagnoses, as emphasized in the medical model and the randomized controlled trials that have been the dominant paradigm in psychotherapy research. Although they do not use the terminology, their discussion shows how the research approaches in this series harken back to the traditional idiographic functional analysis of behavior therapy, with its emphasis on ongoing assessment and dynamic, data-based adjustments in the intervention. They also point out that the type of research reported in this series may be more useful for clinicians than the outcome focus of the randomized controlled trial (RCT) methodology and could help to bridge the scientist-practitioner gap. We add to this that the methods described in this series can be incorporated readily into the RCT design to yield rich data for the study of both process and outcome.

Together, this series highlights the exciting ongoing work in understanding the process and mechanisms of change in cognitive-behavior therapies. Researchers working with a wide variety of clinical problems are meeting similar challenges as they seek to understand the patterns, predictors, and mechanisms of change. An increased sophistication is evident as theoretical and methodological advances allow us to think beyond simple linear change. Intellectual advances outside of psychology, such as dynamical systems theory and neuroscience, have enriched our understanding of the complex process of behavior change, moving us forward in new and exciting directions. It is our hope that this series will provide a catalyst for innovation in psychotherapy research by drawing together work from a variety of laboratories that is not typically published together. We are grateful to each of the contributors for their outstanding efforts in this venture. We hope that readers enjoy these papers as much as we have.

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