

## Kernels vs. Ears, and Other Questions for a Science of Treatment Dissemination

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**Combining intervention diffusion with change in clinical practice and public policy is an ambitious agenda. The impressive effort in Hawaii can be instructive, highlighting questions for a science of treatment dissemination. Among these questions, some of the most important are the following: (a) Who should be targeted for change? (e.g., "downstream" clinicians in practice, "upstream" clinicians in training, consumers, "brokers," policy makers, or payers?); (b) What should be disseminated? (e.g., full evidence-based protocols, specific treatment elements or "kernels"?); and (c) Which procedures maximize change? (e.g., what combination and duration of teaching, supervision, consultation, and other support?). Ultimately, change efforts need to assess what aspects of practice were actually altered, what measurable impact the changes had on clinical outcomes, and what changes in practices and outcomes can be sustained over time.**

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Disseminating interventions, modifying well-established professional practices, and changing public policy are complicated processes in their own right. Combining the three creates at least a triple dose of complexity, and this makes the work described by Nakamura et al. (2011) both impressive and instructive. It was intriguing to learn about Hawaii's efforts on these three fronts as described originally by Chorpita et al. (2002), and it

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is equally intriguing to learn—from Nakamura et al. (2011)—how the work has evolved over a decade, as the Hawaii Empirical Basis to Services Task Force became the Evidence-Based Services (EBS) Committee, and as the work expanded to other service systems outside Hawaii.

The context for this work is dynamic and lively, as one would expect of any activity at the interface of science, clinical practice, and public policy. One element of the context is the controversy over clinical practice and clinical science, and the tension between proponents and opponents of evidence-based practices (EBPs) as identified through randomized controlled trials (RCTs; see, e.g., Baker, McFall, & Shoham, 2008; Weisz, Weersing, & Henggeler, 2005; Westen, Novotny, & Thompson-Brenner, 2004). Another element of the context is the array of large-scale efforts to disseminate evidence-based practices and the implicit struggle to find the most effective dissemination strategies (see, e.g., Bruns & Hoagwood, 2008; Bruns et al., 2008; McHugh & Barlow, 2010). Nationwide dissemination efforts—e.g., the Improving Access to Psychological Therapies program in the United Kingdom (Clark et al., 2009) and the Veterans' Health Administration program in the United States (McHugh & Barlow, 2010)—have differed markedly in their models and methods. And within-state efforts in the United States have varied along an array of dimensions (see Bruns et al., 2008), including the following: (a) initial impetus for change (e.g., internal pressure from leaders within the state versus external pressure from legislative action or a class action lawsuit); (b) the locus of the change effort (e.g., centralized within the state (e.g., in New York) versus county-based (e.g., in Ohio) versus through public-university partnerships (e.g., Michigan); (c) whether and how programs and their effects are evaluated; and (d) whether the work is guided by an overarching theory of change, and if so, what that theory is.

The report by Nakamura et al. (2011) offers a detailed picture of a particularly interesting and influential dissemination effort that (a) was driven mainly by state leadership in its early years and is now evolving to more external guidance, and (b) was conceived as a model for statewide change operated partly through a public-university partnership and is now evolving to a

broader model, touching multiple states and regions and operated through a private business. A particularly interesting aspect of the report is the description of thoughtful decision making that has characterized so much of the group's process over the past decade. For example:

1. The decision to convert scientific evidence review from an episodic to an ongoing process, documented via a continually updatable data management system.
2. The shift from classification based on psychiatric diagnoses to "problem areas," sensible for several reasons, not the least of which is the dynamic nature of the diagnostic system—in which disorders and diagnostic criteria shift with each new edition of the *Diagnostic and Statistical Manual*.
3. The transition to a multiaxial system for examining and reporting treatment outcomes, encompassing multiple dimensions of treatment impact (e.g., youth functioning, consumer satisfaction, impact on caregivers and others in the youth's life) that have been documented in outcome studies.

The EBS work has evolved within the context of the broad socioeconomic and political trends of the decade, including 9/11, the wars in Iraq and Afghanistan, the shifting fortunes of the Democratic and Republican parties, the nationwide financial meltdown, the rocky road to partial economic recovery, high levels of unemployment, and increasing pressure for belt-tightening at state and national levels. The fact that the EBS work has been sustained at all during this decade of turmoil and transition is remarkable in and of itself. Understanding *how* it has been sustained may be very useful to practitioners, researchers, and policy makers alike. The account of the EBS work raises important issues related to changing the climate of clinical care in a state or region where economic, political, and ideological shifts are inevitable over time. The authors note that as the situation in Hawaii changed over the years, sustainability of the work was supported by broadening to include other states and regions, diversifying funding streams, and developing the work into a private business. This model for sustainability is a thought-provoking one that raises significant questions

about the practicalities and public policy issues related to changing practices on a broad scale.

Because the EBS work has involved reviewing, distilling, organizing, and disseminating products of scientific research, it touches on an additional set of questions that are as much scientific as practical. These are questions that are perennial for our field but highlighted in useful ways by the EBS work in Hawaii. Among the scientific questions most proximal to the EBS process are the following:

1. What aspects of clinical practice were changed when the EBS program was put into place? A broad purpose of the EBS work was to bring evidence-based practice into more regular use in the clinical service programs of the state. It will be valuable to learn, if possible, the extent to which that objective was attained. Nakamura et al. (2011) indicate that clinicians were asked to provide self-report data on their practices. Additional data that do not rely on self-report—e.g., in the form of treatment session recordings that might be coded for evidence-based content—would be a valuable complement, particularly in conjunction with a comparison of clinicians who differed in the extent of their exposure to the EBS system.
2. What impact did the changes have on child and family outcomes? Another purpose of the EBS work—arguably the most important—was to improve the outcomes of clinical care for the children served in those programs, and to thereby improve conditions for their families. Thus, it would be valuable to have objective evidence on the extent to which clinical and functional outcomes of treated children (and outcomes for their families) were improved, relative to the outcomes achieved prior to the EBS work (or for children treated by clinicians who differed in their exposure to the EBS support system).
3. What changes in practice and in outcomes have been sustained? The rich account of the evolution of the EBS program, provided by Nakamura et al. (2011) highlights the enduring question of sustainability that is central to dissemination science. Objective measures of clini-

cian practice and of child and family outcomes, if put in place and maintained over time, could provide a valuable database for the study of the holding power of change.

The EBS work also highlights more general questions about the treatment outcome database itself and the most appropriate and effective ways to disseminate its contents and products. Among these questions, some of the most important are the following:

1. Who should be targeted for changes in practice? A critical decision for any group seeking to alter prevailing professional practices is who to target if change is to be maximized. Given its close connection to Hawaii's Child and Adolescent Mental Health Division, the EBS Committee very appropriately placed a special emphasis on reaching downstream practitioners—i.e., those who were already engaged in clinical practice. For other contexts, a case can be made for targeting “upstream,” focusing on groups such as students in graduate and professional schools for whom learning new skills is a natural part of the agenda (see, e.g., Herschell, McNeil, & McNeil, 2004; Lee, 2007; Maddux & Riso, 2007), for targeting consumers with information that will tell them what services are evidence-based and how to find them (e.g., Sanders & Murphy-Brennan, 2010), or for targeting professionals and other “brokers” who *refer* children and families to mental health services to help them refer to providers who offer appropriate evidence-based care (e.g., Kerns, Dorsey, Trupin, & Berliner, 2010; Stiffman, Pescosolido, & Cabassa, 2004). All may be excellent targets. The most effective methods for one target group may not be most effective for the others; there is a lot we need to learn, as a field, about whom to target, and for which objectives, to maximize the spread of effective practices.
2. What should be taught? In what form should the products of the evidence base be disseminated for maximum impact and benefit? Although the Hawaii system has included some intact, named evidence-based practices (e.g., multisystemic ther-

apy), the primary emphasis of the EBS approach appears to be on training clinicians in “practice elements,” discrete clinical strategies such as relaxation training, with different groups of clinicians potentially receiving training in different sets of elements. Others have used this approach, but they have employed different terminology. For example, Embry (2004) and Embry and Biglan (2008) refer to “evidence-based kernels,” in relation to which a full, manual-guided evidence-based practice would be analogous to an ear of corn. Identifying and disseminating elements or kernels may well be an effective way to take some of the best and most readily packaged and disseminable products of EBPs from science and put them into clinical practice. Indeed, this approach simplifies the process in important ways and also may be more appealing to practitioners and policy makers than efforts to disseminate entire treatment protocols. On the other hand, most of these elements have only been tested in RCTs when combined with the other elements of their parent intervention programs. Thus, we lack clear evidence on whether the components are effective when separated from the other elements of their parent programs. Moreover, we lack evidence on whether it is effective to have different individuals or groups learn different treatment elements.

The elements/kernels approach is a notable response to the preferences of those who seek training. It may be an excellent way to upgrade the practices of providers and improve the outcomes of the children they treat; alternatively, it may conceivably inflate procedural variance so markedly that effects of the integrated programs are eroded. The uncertainty we face in this area could make this topic fertile ground for systematic research. Indeed, several related questions could be worthwhile targets for scientific study, each suggested by the valuable work in Hawaii and beyond.

For example, it will be important to understand the relation between identifying the most *common* elements of evidence-based practices and identifying their most *effective* elements. On the one hand, identifying the most common compo-

nents of, say, cognitive-behavioral therapy (CBT) for youth anxiety (e.g., anxiety psychoeducation, building a fear hierarchy, addressing anxiety-provoking cognitions, planning and carrying out graduated exposures) does, in a sense, *define* CBT for youth anxiety. On the other hand, this process may or may not tell us what the components are that actually account for treatment effects. The important work of the EBS group can help point our field toward the challenge of identifying—in addition to common elements—the active elements and mechanisms of change that explain the effects of our most effective interventions.

It will also be useful to break the core question about kernels versus ears into component questions. For example, we need to know whether training in common elements based on practitioner preferences, as opposed to training in intact protocols that have been tested in RCTs, leads to the following: (a) more positive change in practitioner beliefs, values, and attitudes in relation to evidence-based practice; (b) greater increases in practitioner knowledge about the evidence; (c) more consistent application of newly learned practices—with fidelity—in the everyday work of practitioners; and (d) more improvement in treatment outcomes. Weisz, Doss, and Hawley (2006) found that even fully integrated evidence-based treatments, delivered exactly as tested in their respective RCTs, only modestly outperformed usual clinical care, on average. Would a treatment elements approach fare better or worse? Research on this question could contribute something of real value to the field. That said, let us add that this kind of either/or comparison is not the only option available to researchers. It is possible, for example, to organize treatment elements into an integrated treatment protocol and test that protocol within its own RCT (see, e.g., Chorpita & Weisz, 2009; Schoenwald et al., 2008; Weisz & Chorpita, in press).

3. How should training be done? There is increasing evidence (see Herschell, Kolko, Baumann, & Davis, 2010; McHugh & Barlow, 2010) that training workshops alone do not significantly change practice patterns. Building on findings in

this area, our own work in dissemination and effectiveness trials (Schoenwald et al., 2008; Southam-Gerow et al., 2010; Weisz et al., 2009) pairs initial training programs with ongoing weekly case consulting, individually or in small groups. But how individualized should this consulting be? Furthermore, what dose and duration are required for meaningful skill acquisition and sustainable change once expert support has been faded out? The evidence base on these questions is remarkably thin, and the need for answers is acute, because the intensity and duration of support for new learning has cost implications that directly impact the feasibility of dissemination. These important questions, too, are highlighted by the valuable report of Nakamura et al. (2011).

Answering the questions outlined in this commentary will require ample measurement of clinician learning, actual clinician practices during treatment, and child and family outcomes, while expert support for both training and practice is in place and afterward, to assess sustainability. Psychometrically sound measurement and the rigorous analysis that makes such measurement worthwhile, both so critical to the science of dissemination, are often much more difficult to fund than training because these are regarded as “research costs” not appropriately paid from public funding sources. If strategies could be identified for supporting these costs, exciting dissemination ventures such as Hawaii’s innovative EBS program could become the venue for major advances in dissemination science.

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