

White, J. W., Koss, M. P., & Kazdin, A. E. (Eds.). (2011). *Violence against women and children* (Vols. 1–2). Washington, DC: American Psychological Association.

Evidence-Based Treatment Research: Advances, Limitations, and Next Steps

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This article highlights the development of evidence-based treatments (EBTs), the accomplishment their development reflects, and the limitations of current variations as a way of providing mental health services and care. Rather than review EBTs, I use the occasion to provide an overview of my work on the development of treatments for children referred clinically for aggressive and antisocial behavior. This work reflects a larger genre of intervention research that has developed treatments for a variety of disorders. After years of research and a healthy list of EBTs, where are we and where do we need to be? It is still the case that most people in need of services do not receive them, and disparities in providing services remain enormous. The vast majority of therapies, whether evidence based or not, use a model of delivery (one-to-one in-person treatment) that is inherently limited as a way of reaching the large swath of people in need of services. Multiple models of delivery of treatment are needed. The article underscores the importance of developing these models of delivery and optimizing that development by understanding better the mechanisms of therapeutic change.

Keywords: evidence-based treatment research, next steps for psychotherapy research

Within clinical psychology, the development of evidence-based treatments (EBTs) for psychiatric, social, emotional, and behavioral problems is a remarkable advance. EBTs are interventions with controlled studies on their behalf. No single definition or set of criteria has been used to designate treatments as evidence based. Several countries, professions, organizations within professions, and other parties (e.g., third-party payers and state, provincial, and federal governments) have delineated EBTs with a variety of criteria. Even so, commonly used criteria are that the treatment has produced change, which is evident in randomized controlled trials (RCTs) and in comparison with another intervention or no treatment, and that the effects have been replicated. By these criteria, there are effective psychological interventions for many sources of dysfunction (e.g., anxi-

ety, depression, substance use, eating disorders) for children, adolescents, and adults (e.g., Nathan & Gorman, 2007; Weisz & Kazdin, 2010). Despite these advances, most of the procedures used in clinical practice are not those with an evidence base and are not evaluated systematically in their everyday application to examine whether they effect change. In addition, most individuals in need of care are unwittingly in a no-treatment control group (i.e., they do not receive services).

The purpose of this article is to highlight the development of EBTs, the accomplishment their development reflects, and their limitations as a way of having impact on mental health services and care.¹ Rather than review EBTs, I use the occasion to provide an overview of my work on the development of treatments for children referred clinically for severe aggressive and antisocial behavior. After years of research and a healthy list of EBTs based on the work of many, where are we and where do we need to be? It is still the case that most people in need of services do not receive them, and disparities in providing services remain enormous. EBTs as currently developed and implemented may have inherent limitations that preclude their widespread delivery. The article highlights EBTs as a means to convey these broader issues and to suggest lines of work to extend the impact of interventions developed in research.

Development of Evidence-Based Treatments: A Case Study

In the past few decades, many research programs have developed interventions for a variety of psychological and psychiatric dysfunctions in clinically referred populations. The research derived interventions from conceptual views

Editor's Note

Alan E. Kazdin received the Award for Distinguished Scientific Applications of Psychology. Award winners are invited to deliver an award address at the APA's annual convention. A version of this award address was delivered at the 119th annual meeting, held August 4–7, 2011, in Washington, DC. Articles based on award addresses are reviewed, but they differ from unsolicited articles in that they are expressions of the winners' reflections on their work and their views of the field.

¹ The focus is on EBTs (i.e., the interventions carefully evaluated in research). *Evidence-based practice* is a broader term and refers to clinical practice that is informed by evidence about interventions, clinical expertise, and patient needs, values, and preferences and their integration to make decisions about individual care (see Spring & Neville, 2011, for a thoughtful review of EBT and evidence-based practice issues). Evidence-based practice has not been studied by researchers and raises multiple issues (e.g., vagaries of clinical judgment, no guiding rules for decision making if all treatment is individually tailored) well beyond the scope of the present article (Kazdin, 2008).

of a clinical problem or change process, codified treatment in varying degrees of specificity (e.g., treatment manuals or guidelines), and included controlled trials to evaluate treatment in diverse ways (e.g., parametric variations, component analyses, treatment combinations). My work, like the work of many others, represents this focus and is highlighted to make the case later in this article for why very different research is needed now. EBTs reflect an evolutionary step, and it is important to move on from them in ways that retain their strengths but surmount their limitations.

Treatments for Aggressive and Antisocial Behavior in Children

My work has focused primarily on severe aggressive and antisocial child behavior. The characteristic behaviors include fighting, destroying property, lying, using a weapon, being physically cruel to people or animals, stealing from others, forcing someone into sexual activity, fire setting, truancy, and running away. The behaviors reflect an ongoing pattern that often endangers the individuals themselves or others (e.g., peers, siblings, parents, teachers). The children referred for treatment usually have significantly impaired functioning and are unmanageable at home, at school, and in the community. For example, a typical outpatient case would be a 10-year-old boy who is constantly fighting at school and having frequent explosive tantrums at home. Siblings may have been harmed or may be in jeopardy of being harmed. He may be playing with matches in his bedroom at night, not coming home from school, occasionally not going to school even though the parents believe he is there, and making threats to harm others (peers, teachers).

Conduct disorder (CD) is the psychiatric diagnosis that encompasses the dysfunction (American Psychiatric Association, 2000; World Health Organization, 2011). The criteria (e.g., number of symptoms, required duration) periodically change as diagnostic systems are revised. Even so, there is little disagreement that the constellation of symptoms occurs and that CD is an enormous clinical and social problem (e.g., Hill & Maughan, 2001; Lahey, Moffitt, & Caspi, 2003) for many reasons:

- CD has a relatively high prevalence rate (conservatively between 2% and 6% or approximately 1.5 to 4.5 million children in the United States, based on a 2009 population estimate of 74.5 million children).
- It is the most frequent basis of child clinical referrals (e.g., 33% to 50% of cases referred for outpatient treatment).
- It has untoward long-term outcomes (e.g., approximately 80% of children with CD are likely to meet criteria for a psychiatric disorder in adulthood).
- It often leads to untoward consequences for others, including siblings, peers, parents, teachers, as well as

strangers who are targets of antisocial and aggressive acts.

- It is among the most expensive mental health problems (e.g., approximately \$10,000 to \$15,000 per year for each child), as youths traverse special education, mental health, juvenile justice, and various social services.
- It has deleterious physical and medical consequences as well. Many children with CD are subject to moderate-to-heavy corporal punishment or live in very stressful environments, either one of which can have an enduring deleterious impact on their immune system and increase the risk of disease and earlier-than-expected death (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002; Miller & Chen, 2010).

Even these features of CD fail to convey the scope of the problems that routinely include the presence of multiple psychiatric disorders beyond CD, academic deficiencies and delays, deficits and distortions in social cognitive processes, and difficult family situations (e.g., conflict, harsh child-rearing practices).

Interventions and Their Underlying Models

Treatments we provide include parent management training (PMT) and cognitive problem-solving skills training (PSST). Originally, our treatment of choice would have been PMT because of the supporting evidence from basic and applied research on the constituent techniques. However, in our early work with especially severe cases, often there was no parent available to participate in treatment (e.g., because of mental illness, substance abuse, serving in prison, mental retardation, or simple refusal).² For such cases, treatment of the child was needed that did not require direct parent participation.

PMT focuses on parent-child interactions and child behavior at home, at school, and in the community. The intervention draws on two lines of influence: (a) the seminal conceptual and empirical work of Patterson and his colleagues (Patterson, 1982; Patterson, Reid, & Dishion, 1992) that focused on sequences of parent-child interactions in the home, how these interactions can promote child deviance, and how they can be altered; and (b) advances in applied behavior analysis on how to foster behavior change (e.g., Cooper, Heron, & Heward, 2007). Applied behavior analysis developed from operant conditioning research and encompasses interventions that have been applied in many settings and contexts (e.g., military, business, industry, education, and hospitals; Kazdin,

² This work began at an inpatient service (Child Psychiatric Intensive Care Service, Western Psychiatric Institute and Clinic, University of Pittsburgh School of Medicine). This was a locked hospital ward for severely disturbed children ages 5 through 12. The work moved to outpatient services for children referred for aggressive and antisocial behavior, where it has continued (Yale Parenting Center and Child Conduct Clinic; www.yale.edu/yaleparentingcenter).

2001). The techniques draw on multiple influences (e.g., establishing operations, functional analysis, differential reinforcement schedules) well beyond the use of rewards and can alter both parent and child behavior (Kazdin, 2005b).

PSST focuses on cognitive processes, a broad class of constructs that pertain to how individuals perceive, code, and experience the world. Individuals who engage in conduct problem behaviors, particularly aggression, show distortions and deficiencies in various cognitive processes. Examples include generating alternative solutions to interpersonal problems (e.g., different ways of handling social situations); identifying the means to obtain particular ends (e.g., making friends) or the consequences of one's actions (e.g., what could happen after a particular behavior); making attributions to others of the motivation for their actions; perceiving how others feel; and expectations of the effects of one's own actions. Deficits and distortion among these processes relate to teacher ratings of disruptive behavior, peer evaluations, and direct assessment of overt behavior. Our program drew heavily on the pioneering work of Shure and Spivack and the training of young children in problem-solving skills (e.g., Shure, 1992; Spivack & Shure, 1982) along with work on self-instruction and self-control training (e.g., Kendall & Braswell, 1985). Added to this is the heavy use of techniques from applied behavior analysis in the sessions to develop problem-solving skills and prosocial behaviors in role-play situations in which these skills are used.

PSST and PMT emphasize changing how the child responds in interpersonal situations at home, at school, and in the community and with teachers, parents, peers, siblings, and others. Both treatments use learning-based procedures to develop behavior, including modeling, setting events, prompts and fading, shaping, positive reinforcement, practice and repeated rehearsal, extinction, and very occasional mild punishment (e.g., response cost, brief time out) to replace the harsher punishment often used in the home. Repeated practice of the desired behaviors of the parents (e.g., new ways of interacting with their children) and of the child (e.g., using problem-solving skills steps to approach interpersonal situations) is the overarching theme of each session. For both interventions, the skills learned and practiced in the sessions are applied in everyday life. The sessions serve to develop or practice new skills and check and refine behaviors that have been learned in prior sessions.

Overview of Research Foci and Findings

Our tests of treatment effects have relied on RCTs. All children have been cases referred clinically for aggressive and antisocial behavior and primarily with the diagnosis of CD. In more recent work and with the age of clinical referrals becoming younger, we have also included children with oppositional defiant disorder.³ The clinical service for

our work sees children ages 2 through 14; most referrals fall between ages 6 and 12. The families are European American, African American, or Hispanic American (approximately 60%, 30%, and 7%, respectively), with other groups and biracial families forming the remainder. Approximately 50% of our cases come from two-parent families. All socioeconomic–occupational levels are represented, although there is a slight skew toward lower socioeconomic classes. Therapists consist primarily of master's degree mental health professionals with training in various traditional talk and family therapies. Therapists undergo supervised training in the underpinnings of the two treatments in our program followed by practical training, ongoing weekly supervision, and case review. Treatment usually is scheduled for approximately three to four months in weekly sessions but can take longer given the often chaotic lives of many families.

We have pursued complementary miniprograms of research to understand treatment and increase its impact (for a review of the individual studies and citations, please see Kazdin, 2005a, 2010).

Outcome studies. These are direct tests of the effectiveness of PMT and PSST in relation to each other and alternative treatment and control conditions.

Experimental interventions to improve outcome. These studies focus on factors (e.g., parent sources of stress, parent motivation for treatment) that can improve treatment outcome and adherence to treatment.

Therapeutic alliance. This work focuses on child–therapist and parent–therapist alliances and how they relate to parent adherence and treatment outcome and what facets prior to therapy predict and explain alliance and outcome.

Other moderators of treatment. This work elaborates child, parent, family, and contextual factors as well as parent perceptions and expectations as moderators of therapeutic change.

Participation in treatment. In therapy with children, adolescents, and adults, early termination from treatment is between 40% and 60%. This work focuses on who drops out and why and who cancels or does not show up for treatment. A model has been developed to aid the understanding of participation in and attrition from treatment.

Measurement development. Completing the work mentioned previously has required us to develop, test, and validate new measures in such areas as antisocial child behavior (Interview for Antisocial Behavior), hostility versus

³ Children with oppositional defiant disorder often are angry and defiant, lose their temper, get into trouble, and argue a lot. Oppositional defiant disorder is invoked when the behaviors interfere with functioning in everyday life and when others cannot manage the child. Beyond management issues, the presence of this disorder in childhood increases the risk of developing a broad range of psychiatric disorders in adulthood (e.g., Nock, Kazdin, Hiripi, & Kessler, 2007).

aggression (Children's Hostility Inventory), parenting practices (Management of Children's Behavior Scale), barriers that parents experience in relation to treatment (Barriers to Treatment Participation Scale), hopelessness and pessimism (Children's Hopelessness Scale), parent expectancies (Parent Expectancies for Child Therapy), and treatment acceptability (Parent, Teacher, Child Treatment Evaluation Inventories; see Kazdin, 2005a).

Table 1 highlights our main findings about the impact of treatment. Among the many conclusions are that PMT and PSST are effective interventions for children and young adolescents with a diagnosis of CD. The effects have been evident with severe cases (e.g., from inpatient work) and with families with multiple sources of dysfunction and disadvantage (e.g., parent psychopathology, physical disability, poor socioeconomic standing). Are the treatments effective for everyone? Like aspirin for headache, chemotherapy for cancers, and my self-help, multimodal, cognitively informed treatment regimen for RTH (rapidly thinning hair), no, of course not. Yet, on multiple measures, using multiple methods of assessment, indices of clinical significance, and parent and teacher perspectives after treatment, many children improve. Concomitant changes include decreases in stress in the home and in parent depression and other symptoms of psychopathology and improvements in family relations.

There are many next steps for our work. For example, we do not understand how moderators work or the mechanism of behavior change. We cannot yet reliably identify who is very unlikely to profit from the treatments and who is likely to make the rapid gains we see in many families. A high negative loading on moderators of outcome does not mean effect sizes are small or that therapeutic change is nugatory. These and many other questions, as in any research program, are not difficult to delineate. Yet, the broader issues to which I turn trump the continued focus on defensible but narrow questions.

Broader Context

I have highlighted my work on treatment of children with oppositional, aggressive, and antisocial behavior. The stories of many others involved in clinical research are quite similar with changes in details (e.g., specific clinic population and nature of the intervention). Indeed, in some cases, changes in details are minor. For example, currently many variants of parent training and programs of research are readily delineated as applied to youths of many ages and of varying degrees of severity of dysfunction (for reviews, see Lundahl, Risser, & Lovejoy, 2006; Mabe, Turner, & Josephson, 2001; Weisz & Kazdin, 2010).⁴ In addition, when my work began, there was little in the way of evidence to support psychosocial interventions for oppositional, aggressive, and antisocial behavior. There are now multiple interventions (e.g., multisystemic therapy, anger control train-

ing) for such youths, and these encompass young children with oppositional behavior to adolescents adjudicated for violence or sexual offenses (see Kazdin, 2007b).

More generally, progress in treatment research has extended to a wide range of dysfunctions among children, adolescents, and adults, including various forms of anxiety, depression, substance abuse, eating disorders, insomnia, and others (e.g., Nathan & Gorman, 2007; Weisz & Kazdin, 2010). The remarkable progress in evaluating treatments has occurred in the context of increasingly stringent standards for what is required in intervention research. RCT, a term commonly used now, has evolved. This once stood for *raucously conceived trials*, a term my dissertation committee coined after reviewing my initial draft. This evolved to the more familiar term *randomized controlled trials* in use now. We are moving increasingly to *rigidly controlled trials*. This latter variation of RCT raises the bar with more stringent and fixed methodological criteria for conducting and reporting research.⁵ Improved quality can hardly be objected to in principle. Yet, the dilemma is that there is a large therapy research agenda (e.g., most treatments in use have not been evaluated; putatively new and improved treatments emerge all of the time). The number of studies to evaluate existing therapies, compare the relative effectiveness of leading treatments for a given problem, isolate and test critical components of treatment, identify moderators, adapt if and as needed for diverse cultural and ethnic groups, and other common bases for intervention studies approaches infinity. That issue aside, rigorous studies (RCTs with clinical populations) are extremely expensive to conduct and time consuming, attract a small cadre of interested researchers, and draw on diminishing grant funds without which such research is extremely diffi-

⁴ There are many researchers to identify whose contributions to parent management training for children with disruptive behaviors are seminal. The work began with the pioneering studies of Gerald Paterson and his colleagues and followed with well-established research programs by Sheila Eyberg, Rex Forehand, Matthew Sanders, and Carolyn Webster-Stratton.

⁵ Several organizations and groups have developed standards for reporting research, and in the process they have conveyed the need to address several facets of the trial (e.g., how the sample was identified, how many started in the trial and completed treatment, statistical power and how parameter estimates were made to calculate power, and whether participants received the intended treatment). Examples of such standards are the Consolidated Standards of Reporting Trials (or CONSORT; Moher, Schulz, & Altman, 2001), Transparent Reporting of Evaluations With Nonexperimental Designs (or TREND; Des Jarlais, Lyles, Crepaz, & the TREND Group, 2004), Reporting Standards for Research in Psychology (American Psychological Association Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008), and Standards for Reporting on Empirical Social Science Research in American Educational Research Association Publications (American Educational Research Association, 2006). The CONSORT standards, arguably the most familiar, have been adopted by hundreds of professional journals from many disciplines and countries (see www.consort-statement.org/about-consort/supporters/consort-endorsers-journals/).

Table 1
Summary of Main Outcome Findings

- For children with conduct disorder, parent management training and problem-solving skills training, alone or in combination, result in reliable and significant reductions in antisocial behavior and increases in prosocial behavior.
 - Gains for these treatments surpass those of alternative treatment conditions (e.g., treatment as usual, play, relationship therapies).
 - Therapeutic effects are evident for both inpatient and outpatient school-age children and are evident on measures of child functioning at home, at school, and in the community both immediately after treatment and up to one or two years later.
 - The magnitude of change is clinically significant (e.g., many individuals fall within normative levels of functioning for same sex and age peers by the end of treatment).
 - Treatment effects are also evident on reductions in maternal depression and other symptoms and stress in the home and in improved family relations.
 - Treatment is effective with severe cases, with cases that have multiple disorders, and with families that have severe stressors, parent clinical dysfunction, and socioeconomic disadvantage, although these factors influence remaining in treatment and clinical outcome.
 - The expected qualifiers apply: Treatment does not work with everyone, some clients drop out of treatment but not more or less than with other interventions, a significant minority of those who drop out show early or so-called sudden treatment gains.
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Note. Studies in support of these statements and additional findings are provided elsewhere (Kazdin, 2005a, 2010).

cult to do. There is a clash between what is required (research to better evaluate and develop interventions) and what can be accomplished with current resources. Designs other than RCTs (e.g., single-case experimental designs; Kazdin, 2011; small clinical trials; Evans & Ildstad, 2001) and statistical techniques when groups cannot be formed randomly (e.g., propensity scores; Hong & Yu, 2008) can expand evaluation options but do not solve the problem.

Expanding the Research Agenda and Focus

As progress emerged in developing EBTs, many issues, challenges, and debates emerged with them regarding the criteria for identifying such treatments, whether and how EBTs are to be used in clinical practice, the role of clinical judgment in selecting and modifying treatment, and others. Above the fray, two broad research issues can be identified that pertain to the goal of treatment, namely, actually helping people in need of services. The first issue pertains to limitations of the current model of delivering psychological treatment. The second issue is the importance of understanding precisely how treatments work, so we know what to retain and optimize as treatments are delivered in novel ways.

Models of Delivering Therapy

Current mismatch of the dominant model and need for services. The vast majority of psychotherapy consists of individual one-to-one therapy with a client or with some small unit (e.g., a couple, family, or group). I focus on how treatment is delivered (i.e., the *model of delivery*) as distinguished from the specific technique (e.g., parent management training, cognitive therapy, exposure-based treat-

ment). The model of one-to-one treatment has a long history in medical care and healing. In psychotherapy, the model received a major boost with the development of psychoanalysis and is forever branded on our minds by the genre of psychotherapy cartoons.

Over the past 50 years, many novel conceptual views of therapy have been proposed, drawing from content areas and perspectives (e.g., learning, cognition, emotion regulation, self-theory, family interaction). Even more dramatic is the endless flow of new therapy techniques (e.g., horticulture therapy, smudge therapy, authentic process therapy), even though we know so little about the hundreds already in use (Kazdin, 2000). Amid this conceptual and technique diversity, the model of delivery has remained largely unchanged. Indeed, the vast majority of never or poorly researched treatments (e.g., most treatments as usual) and EBTs retain this model, as illustrated in my own work, highlighted previously. The exceptions to individual therapy (e.g., couples, family, or group) do not alter the concern about the general model.

The context for delineating the model has to do with what therapy is trying to accomplish. Psychotherapy has many goals, but salient among them is the amelioration of psychiatric disorders; social, emotional, cognitive, and behavioral problems; and stress (e.g., Dickerson & Lehman, 2006; Weissman, Markowitz, & Klerman, 2000). In principle, psychotherapy is a viable intervention for mental health problems (e.g., anxiety, depression, bipolar disorder) in addition to other sources of impairment (e.g., stress). In practice, psychotherapy is for a select group because of the dominant model of delivery.

Mental health problems are abundant. For example, in the United States, approximately 25% of the people (population approximately 310 million) meet criteria for one or more psychiatric disorders in any given year (Kessler & Wang, 2008). The estimate of those who might benefit from services might be conservative because many diagnoses are on a continuum, and just missing the cutoff for a diagnosis can be associated with impairment. In any case, the 25% indicates that a large number of individuals could profit from treatment. Yet, approximately 70% of the people in need of services do not receive them (Kessler et al., 2005). The proportion is higher for African Americans, Hispanic Americans, and Native Americans (Merikangas et al., 2011; Wells, Klap, Koike, & Sherbourne, 2001).

Mental health professionals who provide services are concentrated in heavily populated, affluent urban areas and in cities with major universities; hence, these professionals cannot easily reach the large swaths of people in need (e.g., in rural areas and small towns; Health Resources and Services Administration, 2011; Richards & Gottfredson, 1978). Too few professionals in minority groups are available to reflect and match those in need of care. Also, too few mental health providers offer services for or have interests in special groups (e.g., children, the elderly), where many of the services are needed most (Institute of Medicine of the National Academies, 2008).

People in need of services do not receive them for many reasons, including access to facilities or practitioners, lack of insurance, ethnic and cultural barriers, concern about stigma, and concrete obstacles of daily life (e.g., transportation, babysitting). Thus, one cannot propose that the model of delivering psychological services is the single or necessarily even the main reason why people do not receive services. Even so, psychotherapy as currently delivered (one-to-one and in person) arguably is the model least able to reach large segments of the public. I have noted the remarkable progress of developing EBTs. For the next steps in research, we ought to continue the evidence focus but attend to different models of delivery.

Novel and multiple models of delivery are needed.

Novel ways of delivering psychological services are needed that have as their main characteristic the ability to reach diverse segments of the population. Many models of delivering treatment are available, but they are not mainstream (e.g., not part of routine clinical training in psychology, psychiatry, or social work; not recognized by licensing boards). Some of these involve one-to-one therapy in which long-distance services can be delivered (e.g., by computer, telephone, Internet) to reach beyond the geographical concentration of trained professionals; some of these do not require a highly trained mental health professional but rather use bachelor's-level individuals, peers, and other individuals who have traversed training. Still oth-

ers require very little or no contact because they are self-administered (e.g., through Web materials). Finally, other models use the media and can have a broad sweep through TV and radio (see Dimeff, Paves, Skutch, & Woodcock, 2011; Harwood & L'Abate, 2010; Kazdin & Blase, 2011). A review is beyond the scope of the present article, but a few examples can convey novel models and their reach.

Computerized treatment for depression. Cognitive therapy for depression is a well-established EBT and usually is administered as one-to-one therapy. Computer-delivered treatment has been available for some time and has evidence in its behalf (Bennett-Levy, Richards, & Farrand, 2010). Beating the Blues is one such version of treatment that is interactive, multiple media, and computerized (www.beatingtheblues.co.uk). Treatment begins with a 15-minute introductory video; then, weekly sessions are provided by computer, and these include homework activities. Separate modules are presented (e.g., automatic thoughts, core beliefs, attributional style), and treatment can be individualized by additional modules that may also apply (e.g., graduated exposure if the patient has anxiety). Computerized treatment has been more effective than treatment as usual, as is evident on multiple outcome measures, including measures of depression, anxiety, work adjustment, and impairment (e.g., Proudfoot et al., 2004).

Telephone-based treatment for smoking. Quitlines refer to a telephone-based counseling technique. Tobacco users call in and receive an evidence-based, manualized intervention that provides materials by mail, prerecorded messages, real-time phone counseling or a return phone call from a counselor, access to medication to help with quitting, or some combination thereof, and taped calls to address possibilities of relapse (Graham et al., 2011; Lichtenstein, Zhu, & Tedeschi, 2010). Staff with bachelor's- or master's-level training deliver the counseling services, although computers carry out much of the quitline counseling. Quitlines are offered in all 50 states and Washington, DC; an estimated 1% of smokers in the United States utilize the services annually (Cummins, Bailey, Campbell, Koon-Kirby, & Zhu, 2007). Quitlines reach underserved populations; African American smokers are more likely than any other ethnic group to utilize these services, and Asian immigrant smokers are as likely as European American smokers to utilize them (Maher et al., 2007; Zhu, Wong, Stevens, Nakashima, & Gamst, 2010). Quitlines are a type of brief, standardized, and semianonymous phone counseling that can greatly increase the accessibility and reach of an intervention.

Expressive writing for test anxiety. Expressive writing is a therapy technique developed formally in the mid-1980s (Pennebaker, 1997). The intervention consists of writing about an experience, feelings, or thoughts, such as undisclosed trauma or a source of stress. The writing is relatively brief (e.g., 20 minutes per day for 4 days), al-

though durations vary. Expressive writing has been applied to a variety of psychological problems (e.g., anxiety, depression) and stress resulting from medical diagnoses, job loss, and loss of a significant other (through death, relationship breakup) and has been evaluated in several controlled studies (Pennebaker & Chung, in press). A recent example used expressive writing to improve exam performance of individuals under pressure to perform (Ramirez & Beilock, 2011). Anxiety, worry, and rumination about exams can interfere with performance. Four studies were completed under laboratory and natural (classroom) settings in which individuals engaged in expressive writing (one occasion of writing) under conditions of high-stakes test taking (e.g., peer pressure, monetary incentives, and social evaluation from others). Students were asked to write about their exam-related thoughts before the test (expressive writing); others were given an unrelated writing task. Those assigned to the expressive writing condition improved test performance (e.g., math); those in the control condition “choked under pressure” (p. 212), that is, their performance became worse. Moreover, the intervention was especially effective for highly anxious students.

This example does not focus on a clinical population referred for treatment. Expressive writing has been applied to clinical dysfunction, but the example conveys another point. There is a great deal of misery that is not brought to treatment or formally diagnosed. Models of delivery that could reach many people in need might also be able to reach people who are not in desperate need but who are almost or sort of in need, people whose lives could be made appreciably better by having interventions more readily available.

Text messaging to improve health care. An example of medical treatment shifts the outcome focus but conveys the potential role of sending text messages to people to improve adherence to a treatment regimen. In this example, the focus was on having individuals infected with HIV adhere to their antiretroviral treatment (Lester et al., 2010). Three clinics in Kenya, Africa, participated (low income, high income, and rural settings). The majority of citizens in the country are mobile phone subscribers. Effective HIV treatment requires adherence to the regimen (taking medication), which reduces the likelihood of resistance to the drug. Resistance to the drug also can foster the spread of HIV. Automated text messages were sent to make contact with people and convey that someone cared; specific reminders to take the medication were not included. Patients were required to respond within 48 hours. If they indicated problems or did not respond, the clinic made contact for a follow-up communication. The results indicated greater adherence (self-report) and reduced viral load (assessed from plasma) among those assigned randomly to text messaging compared with those assigned to the standard control (no messaging) treatment.

I mention this example because of the study’s ability to reach individuals in diverse settings (e.g., rural) and in settings where in-person individual contact is less feasible. The text messaging focused on nonspecific contact and provided general support, which was sufficient to improve outcome. Individuals who did not respond within 48 hours or who responded indicating a problem with compliance were contacted. This *stepped care* feature provides the more intensive attention where it is needed. In the context of the present article, the model of delivery (not the treatment per se) was genuinely tailored to what was required by the patient. It is no leap to consider how text messaging might be used to help individuals in everyday life by providing regular support and message-framed comments to foster control of some problem domain or exercises to cope or redress some automated thoughts.

General comments. I have illustrated models of delivery that depart from one-to-one in-person therapy by a professional. The illustrations were intended only to convey that the class of novel models of delivery has many members already rather than to represent the scope of the delivery options. Indeed, as models develop, it is likely that the most promising will emerge from the technological developments in tablets and super smart phones with their various applications. Already the range of apps for clinical problems is impressive and expanding (e.g., anxiety, depression, eating disorders, sleep disorders, stress, and more). The options include better and real-time assessment of clinically relevant information (e.g., mood, stress), feeding that back to the individual client or to a clinical service, and prompting the use of helpful interventions (e.g., coping) in light of that data. The old medical joke, “take two tablets (aspirin) and call me in the morning,” is heading for a technological face-lift along the lines of “take your tablet and call up treatment in the morning or actually whenever you need it.”

No single model of delivery of treatment will reach most people in need. A portfolio of models will be needed to overcome the range of barriers to delivering or providing access to care (see Kazdin & Blase, 2011). The portfolio will include different ways of reaching people and reaching different segments of the population in diverse contexts (e.g., by age, geographic locale, cultural compatibility of the modality). Already there is much activity in recognizing the need for interventions that can reach larger swaths of people and that have lower costs of delivery (e.g., level of training of the practitioner, cost of the service itself; e.g., Bennett-Levy et al., 2010; L’Abate, 2007). Among the challenges is identifying effective interventions, designing ways of delivering or packaging them so that they can be extended without degradation in effectiveness, and then making the treatments mainstream.

Individual therapy will remain a viable delivery model because life’s crises and challenges are at the individual

level. Even so, such cases do not necessarily argue for in-person treatment or necessarily require master's- or doctoral-level therapists. The roles and need for mental health professionals at different levels of training raise a host of weighty professional questions, but these questions can be distinguished from the empirical question of what is needed for treatment to effect change. At what point, for whom, and when are different levels of therapist training (i.e., bachelor's, master's, doctoral) needed? The default position might be to proceed with the level that has the greatest reach and lowest cost as the first line of attack. What can be accomplished by mobilizing a wide range of professional, peer, and lay therapists and modalities of delivery to reduce the burden of mental illness and to provide interventions to the vast majority who need but do not receive services? Perhaps there are new roles for doctoral-level practitioners that would facilitate a transition to new models of delivery. Individual therapy by a highly trained professional as a model and modality would be reserved and provided only as needed and as determined by evidence that lesser treatment efforts were ineffective.

The value of contemporary work on individual therapy in reducing the burden of mental illness may derive from uses other than direct applications of one-to-one treatment. Some therapy techniques might be delivered in multiple ways so that the same treatment or very close approximations may vary in their accessibility and reach. I mentioned parent training earlier as a one-to-one in-person treatment, but the model of delivery has been extended in many ways (e.g., through DVD, computer) to reach more people (e.g., Sanders, 2008). More generally, in-person therapies developed for depression, anxiety, and child behavior problems have online versions that can extend treatment with little or no therapist involvement (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Dimeff et al., 2011). Thus, knowledge gained about therapy in its not very disseminable delivery model might be very useful in developing treatments that have a large reach.

Understanding Critical Components and Mechanisms of Change

The work on EBTs and the continued proliferation of treatments in clinical work without evidence on their behalf underscore the need to identify critical components of treatment and mechanisms of change (Kazdin, 2007a). Critical components refer to those ingredients of the treatment that are essential for therapeutic change to occur or for a particular level of change to occur. As we modify treatments so that they can be delivered in different ways, we want to know precisely what facets of treatment need to be retained to activate and trigger the change process. For example, single-session treatment of post-traumatic stress disorder integrates two critical components of anxiety treatment (e.g., increasing a sense of

control, exposure to the disabling settings and cues; Başoğlu, Şalcioğlu, Livanou, Kalender, & Acar, 2005). Devising the abbreviated treatment drew directly on laboratory and treatment research on anxiety. Identifying critical components of treatment as in this example is useful for developing novel means of delivery.

In traditional individual therapies, the therapeutic alliance is considered to be a critical component of change and, indeed, is said to be "important in all psychological interventions" (American Psychological Association Practice Directorate, 2011) and the component on which the "effectiveness of all types of therapy depends" (Department of Health, 2001, p. 35). It might well be important in some psychological interventions, although plainly change can be achieved when no other person than the client is involved in treatment (e.g., Barak et al., 2008; Dimeff et al., 2011; Harwood & L'Abate, 2010; Muñoz, 2010). Yet, different interventions may well have different essential components.

There are hundreds of therapy techniques, and identifying their critical components to develop novel models of delivery is not feasible. Identifying their critical components is sometimes accomplished by dismantling studies that compare groups with and without salient components. The goal is to identify the necessary, sufficient, and facilitatory components of the treatment. This type of research is not feasible on a large scale in light of the number of studies required and the number of techniques in use. A more productive focus is understanding the mechanisms of therapeutic change, that is, precisely how treatments work (i.e., how change comes about and why).⁶ Mechanisms elaborate the unfolding processes leading to change, what needs to be activated to effect change, and the ways in which processes can be activated. Perhaps we can identify what needs to be activated to effect change, and then we can identify the many different ways the critical process or processes can be activated. All of this requires a deeper understanding of therapies than we now have.

Understanding mechanisms can be advanced greatly by connecting psychotherapy research with basic science research. By basic, I refer to research that elaborates core psychological processes and their mechanisms of action. Presumably, these mechanisms of action reflect domains altered or activated by intervention techniques. Enormous

⁶ By mechanism, I mean the processes or events that are responsible for the change and specifically how these processes unfold to lead to therapeutic change. For example, precisely how does an experience (e.g., discussion of cognitions, practice) unfold in a step-by-step way to lead to symptom change? This is not a conceptual model, although a model may guide the research, but rather is a description of how change happens. The more common focus on mediators is not what I have in mind. A mediator is an intervening variable that may account (statistically) for the relationship between the independent and dependent variable. Something that mediates change may not necessarily explain the processes of how change came about.

advances have been made in neurosciences and cognition, to mention two broad areas. Many of these advances have stemmed from technological advances in assessment that permit increasingly fine-grained description and modeling of the interplay of psychological (e.g., learning) and biological processes (e.g., changes in neurons, receptors). Psychotherapy researchers could profit from collaborating directly and more systematically with basic science researchers to elaborate the change processes in therapy, the underlying mechanisms with which they are associated, and how these mechanisms can be activated to improve treatment outcomes.

As one example, research on loneliness and its effects on psychological and biological functioning has been studied for over 30 years (Peplau & Perlman, 1982) and continues to be an active area of work (e.g., Cacioppo & Patrick, 2008). Loneliness refers to the subjective experience of social isolation, not to the actual number of social contacts a person has, although both have been studied. The subjective experience of loneliness over an extended period is associated with unhealthy changes in cardiovascular and immune systems (Hawkley & Cacioppo, 2010). Such individuals are prone to poorer health. Moreover, the risk of death of social isolation is about as great as smoking cigarettes and greater than the effects of physical inactivity or obesity. Extended periods of loneliness elevate a variety of measures associated with chronic stress, increased activation of genes that encode signaling molecules that promote inflammation, and decreased activation of genes that ordinarily thwart inflammation and that help defend against virus (Cole et al., 2007). These findings help explain increased susceptibility of lonely people to a variety of illnesses and early death.

It would be valuable to connect psychotherapy with the programmatic work on loneliness. The connections are obvious at broad levels given that therapy is very much about social support and overcoming isolation. Indeed, a classic book has referred to psychotherapy as the *purchase of friendship*, which may be a fairly strong antidote to loneliness (Schofield, 1986). The challenge: Can we identify interventions within the context of treatment that at once affect subjective experience of loneliness and its biological correlates known to influence health? In these demonstrations, can we perform psychological “knock out” studies in which we can demonstrate that only some types of interpersonal interactions can produce changes in the experience and biology of loneliness? In an example mentioned previously, test performance under high-pressure conditions was enhanced if preceded by expressive writing (Ramirez & Beilock, 2011). Yet, it was not any writing, but writing that specifically focused on worries, that improved performance. Presumably, in psychotherapy not just any contact with a professional, but only some types of interactions, might lead to changes in the experience of loneliness and

its biological concomitants. Beginning with clear demonstrations of what specifically does and does not lead to change is a beginning, and this can be enhanced by measuring impact on psychological and biological processes that relate to clinical dysfunction.

The benefits of forming stronger connections between basic science and psychotherapy are not intended to be inspirational or aspirational. There are beyond promising leads already. For example, understanding loneliness better can be used to elaborate and improve psychotherapy. A meta-analysis of intervention studies has suggested that simply providing social support and contact is not sufficient to reduce loneliness. Rather, using cognitive behavioral techniques that shift clients’ attention and evaluation of social situations to more positive attributes can alter loneliness (Masi, Chen, Hawkley, & Cacioppo, 2010). This is a beginning that uses basic research findings to guide therapy. We could move to understanding the mechanisms of action of psychotherapy as a next step.

Perhaps the most well-studied psychotherapies are exposure-based treatments of anxiety. Graduated exposure is considered to lead to extinction of some stimuli in the environment (e.g., social situations, the object of a phobia) and to fear reduction. Animal laboratory research on fear conditioning has advanced psychotherapy. Programmatic work has identified mechanisms through which extinction occurs in animal laboratory research and has shown how extinction can be enhanced or interrupted (Davis, Myers, Chhatwal, & Ressler, 2006). It is now fairly well known that these findings have been extrapolated to psychotherapy research, with several studies showing with clinical samples that an effective treatment (exposure-based therapy) can be improved by activating the mechanism (by ingesting D-Cycloserine) studied in laboratory research (Norberg, Krystal, & Tolin, 2008).

Extraordinary advances have been made in understanding emotion, fear, trauma, and basic processes (e.g., memory, attention) that are related to clinical dysfunction (e.g., social behavior, autism, schizophrenia; see Shiromani, Keane, & LeDoux, 2009; Whalen & Phelps, 2009). Basic research has developed paradigms for assessing mechanisms of psychological processes that could elaborate the underpinnings of therapeutic change. The needed advance is on the therapy side: What changes are occurring in therapy that draw on and activate such processes, and can we enhance those processes to augment treatment outcome effects? I have mentioned that there are EBTs, but there is little in the way of evidence-based explanations of treatment effects. There are opportunities like never before to provide these explanations and then to draw on them to improve treatment and the models through which they are delivered.

Conclusions

I began this article by discussing my work on treatment of children referred for aggressive and antisocial behavior. With similar work by others, there are now many treatments with supportive evidence for children and adolescents referred clinically because of their oppositional, aggressive, and antisocial behaviors. Beyond that, evidence-based psychological treatments have now emerged for several clinical problems experienced by children, adolescents, and adults.

The emergence of EBTs raises many conceptual, methodological, and applied issues, such as the theoretical bases of treatments, the impact of treatment on client functioning in everyday life, the extent to which treatments effects are enduring, and whether and how to extend treatments to clinical practice, *inter alia*. I mention a few key issues here, if only in passing, to avoid implying that we are at the end of some path to the development of effective interventions. Similar to the invariable refrain we hear at university graduations every year as fresh undergraduate and graduate students are launched to their next stage of life, “This is not the end; this is the beginning. That is why we call it ‘commencement’.” And so it is with developing effective interventions. Armed with interventions that effect reliable change, we are at the beginning of a more difficult agenda.

My focus has been on two broad issues that may be part of that more difficult and less frequently discussed agenda. First, the dominant model of individual in-person therapy for the treatment of psychological problems has inherent limitations in reaching the large majority of individuals in need of psychological services. Our most well-studied treatments cannot reach people at the scale needed if they are provided on a one-to-one, in-person basis. Typically, research has begun with conceptualization of a clinical problem (e.g., anxiety), and treatment and then moves to trials to test the effects of the intervention. Not only is this a reasonable approach, but it has brought us to the excellent place of having a cadre of EBTs. Perhaps at this point, research ought to begin with consideration of the model of delivery and specifically with a model that could be broad in its reach. To whom can a given model of delivery be applied? What are the –two or three most effective means (models) of delivery to reach the intended group? We begin with intervention models that, in practice, can have reach. That such treatments are evidence based can be taken as a given agenda. Yet, even now many clinical dysfunctions do not have EBTs. But that fact alone may not argue for a nonevaluated individual, in-person psychotherapy that cannot reach many people in need. Too much progress has been made on alternatives (e.g., Barak et al., 2008; Bennett-Levy et al., 2010; Harwood & L’Abate, 2010; L’Abate, 2007) to argue for individual psychother-

apy as the starting point of a treatment regimen for most people, most of the time.

A given model of treatment delivery does not need to reach most people; we need multiple models to do that. But our point of departure ought to be who can be served by the model of delivery embedded in or associated with a particular intervention. To continue to develop or emphasize EBTs that have such a restricted application might be justified if they make theoretical breakthroughs or advance our understanding in ways that could be deployed to reach many people not otherwise served.

Second, a high priority is to understand precisely how therapeutic changes come about. The delineation of EBTs shows that we can produce change. We do not know how an interpersonal interaction, set of therapist comments, series of activities or exercises, and so on operate concretely to change fear of open spaces, stress, obsessions, disgust of oneself or others, interpersonal violence, or engaging in self-harm. What gets activated in the therapy intervention, and what is the step-by-step process leading to change? For optimizing therapeutic change and for individualizing therapy (*à la* individualized medicine), this information is essential.

There are opportunities now more than ever to describe meticulously the changes made in psychotherapy, how social interaction and learning experiences translate to biological changes that are stored and retained, and how these, in turn, translate to social, behavioral, emotional, and cognitive changes that we call improvement. Connecting psychotherapy to basic psychological processes (e.g., sensation, perception, learning, cognition, emotion) is not only drawing on models for conceptualizing an intervention but also using the methods of basic science to understand therapeutic change in relation to these processes. Collaborative work of this nature could advance treatment research and patient care. EBTs moved us to this point—evidence remains important as a constant, but it is time to move on to interventions we understand and that reach those people who are systematically excluded from current services.

I have restricted the comments of this article to treatment because of the progress and the continued pursuit and emphasis of a model that limits help for the vast majority in need. There are other topics that are central to reaching and helping people in need with effective psychological interventions. Prevention is a partner in reducing the burden of mental illness, and multiple models of delivery are relevant there as well (e.g., see U.S. Department of Health and Human Services, 2010). Also, models and topics from other disciplines are relevant to modify the way we conceive and provide treatment services. In business, for example, the notion of disruptive technology, or disruptive innovation, refers to innovations that alter a product and its delivery in novel ways. The change or innovation is not the usual evolutionary or incremental step in product development but rather provides something different and serves and indeed develops a market that is not being

served (e.g., Christensen, 2003; Christensen, Grossman, & Hwang, 2009). Examples are evident in manufacturing (e.g., interchangeable parts, the assembly line in car production), business (e.g., cell phones, smart phones, tablets), consumer purchasing (e.g., credit cards), health care (e.g., home pregnancy tests, medical robotics, services such as flu shots or blood pressure testing in stores). Each was not so much an evolutionary step as a leap in innovation that quickly began to diffuse through the marketplace and reach people. Such interventions often provide simpler, less expensive, or more convenient solutions to problems and can be scaled to reach people. This is only one model mentioned in passing to convey that the solutions to the problem of reaching people in need may require different ways of thinking.

Perhaps treatment researchers or practitioners cannot be expected to make the leap to redesigning treatments so that they are at once evidence based and utilize models that reach people in need. The expertise may require collaboration with others whose knowledge of business models, marketing, market penetration, and no doubt other skills and domains can move a product (effective interventions) to reach people. Yet, there is a part that we (psychologists) can initiate, namely, commitment to the goal of reaching people in need. Our own training models (e.g., accredited or nonaccredited training, clinical licensing) and delivery of services might begin to match that commitment or at least challenge training, clinical care, and business as usual. These alone would entail a reorientation that is a beginning but perhaps the most difficult part of the journey.

Author's Note

I am deeply honored by and grateful for the Award for Distinguished Scientific Applications of Psychology. The work for which this award was provided depends on the combined efforts of many collaborators, including a remarkable clinic staff, students, and colleagues. I could not have completed any of the work without them and, given their enduring dedication and commitment, would not have wanted to. The work was also made possible by support from the National Institute of Mental Health, the William T. Grant Foundation, the Robert Wood Johnson Foundation, the Rivendell Foundation of America, the Leon Lowenstein Foundation, and Yale University.

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