DOCTORAL TRAINING IN CLINICAL PSYCHOLOGY

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■ **Abstract** Competing models of doctoral training in clinical psychology are described and compared within their historical contexts. Trends in the field are examined critically with a focus on the impact of managed care on doctoral training and clinical practice. Implications for the future of doctoral training are considered, and a blueprint for the future of doctoral training in clinical psychology is presented.

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OVERVIEW

The dual aims of this review are to examine the evolving state of doctoral training in clinical psychology and to offer a possible blueprint for its future. Reviews inevitably are influenced by the authors' personal views. Because this review challenges the status quo, I want to assure the reader that I am not an interloper or gadfly; I am deeply committed to clinical training and clinical science. Nor am I a nihilist; I offer my review in the optimistic belief that clinical psychology potentially has the resources, integrity, and resolve to assess its present and future circumstances objectively, take the necessary steps to remain viable, and contribute to the future mental and physical well-being of our society.

To gain a fresh, comprehensive overview of the field's current challenges and future prospects, I examined more than 1000 articles on clinical training published over the past 15 years in the leading professional journals and newsletters. I also made good use of Web sites and sought advice on important developments from a network of colleagues. The broad scope of this material expanded my previous perspective on clinical training's past, present, and future. Unfortunately, only a few of these articles and resources could be cited here. My intent is to offer an overview and synthesis of the themes, issues, and trends in the field, and to consider their implications for the future of clinical training.

I begin with three general observations. First, I came across no reports of controlled studies of the effects of different models or methods of doctoral training in clinical psychology. Thus, my review is based largely on interpretations of descriptive data, correlational results, and qualitative evaluations. There is a dire need for solid research on doctoral training.

Second, reviewing the literature convinced me that doctoral training in clinical psychology stands at a crossroads. The field must appraise its situation carefully and begin charting its future course with a sense of urgency. Below I discuss the forces that brought us to this juncture, describing how they are pushing us swiftly and inexorably toward a radical restructuring of both our educational system and our health-care system. The futures of education and health care are intertwined tightly. Our education and training ideally should be driven by the needs of the health-care system; the quality of our health-care system, in turn, depends on the validity of our education and training. Responding effectively to current challenges requires objective analysis, creative problem solving, and decisive action. Anything less will marginalize clinical psychology—along with the doctoral programs that train clinical psychologists—in the rapidly evolving educational and behavioral health-care systems.

Third, we cannot perpetuate the status quo in clinical training simply because it is familiar and comfortable; we cannot continue to train doctoral students the

same old way simply because we've always done things this way. If evolving circumstances render past approaches no longer defensible or sustainable, then we must face this reality and deal with it forthrightly. This is a central theme of this review.

When Astin (1961) wrote about the "functional autonomy of psychotherapy," he was referring to the tendency for psychotherapeutic practices to take on lives of their own, to become independent of the clinical problems for which they were designed initially and the conceptual foundations on which they were based. This notion of functional autonomy is captured by the Berry's World cartoon depicting two leather-clad motorcyclists astride their Harley hogs at a stoplight, both with outstretched arms, hands perched aloft on high-rise handlebars. Responding to a question from a pedestrian on the curb, one cyclist turns to his buddy and says, "I dunno... Hey, Moose! Why DO we have handlebars like this?"

Many current approaches to doctoral training in clinical psychology show signs of functional autonomy. We rely on models and methods long after their original foundations have been forgotten or abandoned, without questioning their value, simply because we always have done things this way. The first step in developing a viable blueprint for the future of doctoral training in clinical psychology is to look critically at our current training. Like the motorcyclist, we should be asking, Why ARE we doing this?

Snapshot of Psychology and Clinical Training

This question assumes that we know what "this" refers to. We need a snapshot of clinical psychology, one of those signs with a red *x* that reads, "You are here." Dry, as statistics tend to be, the extensive data set compiled and published by the American Psychological Association (APA) Research Office (2005) provides the best, most up-to-date, wide-angle snapshot of contemporary psychology. I rely on this rich resource throughout the review. I do not have space to summarize these data in detail, but the following are some highlights.

Currently there are about 100,000 psychologists with doctorates across all specialty areas, approximately 75% of whom are employed full time, primarily in for-profit or self-employed positions (40%) or in colleges, universities, or medical schools (35%). Surprisingly, over 40% are working in positions not directly related to psychology. Women and people of color have made significant gains in psychology over the last 30 years. Women now make up roughly 50% of the current workforce, 70% of the new graduates, and 75% of the current doctoral students. People of color make up approximately 10% of the workforce, 15% of the recent graduates, and 22% of the trainees. For recent doctorates, 77% of those in the health-service-provider subfields carry a training-related debt, as compared to 58% of those in research and other subfields. The mean debt for the health-service group is $58,885; for the research/other group it is $33,755. Twenty-four percent of the health-service group, as compared to only 5% of the research/other group, carry a training-related debt in excess of $75,000.

To see what actually is happening in doctoral training programs, one must look at the programs' Web sites or brochures. In particular, one should examine the data programs submit to the Committee on Accreditation (CoA) in their annual self-study reports. A more detailed description of the programs' philosophy, curriculum, students, faculty, resources, and training outcomes is submitted to CoA as part of the full accreditation application, although this information may not be not readily available to the public. On paper, the content and structure of doctoral programs appear fairly standardized, primarily because of the constraints of accreditation and licensing requirements. Of course, the devil is in the detail. On closer inspection, the specific content of core courses, practicum training, and scholarly work varies considerably across programs. Unfortunately, there is little published data documenting some of the more important differences. Comparative self-report data are published in the *Insider's Guide to Graduate Programs in Clinical and Counseling Psychology* (Norcross et al. 2004b), a resource used by many applicants. However, these data are not as highly correlated with the CoA self-study data as one might expect, given that both come from the same source (R.K. Blashfield, personal communication).

Asking "Why" Before "What" and "How"

Such snapshots give us a static picture, but they do not address the more fundamental questions: What should training programs be doing, and how should they be doing it? Logically, the answers to these "what" and "how" questions depend on the answer to the "why" question. We first need to know why we have training programs, and what we are trying to achieve with them. Ignoring the "why" question amounts to functional autonomy; so-called ostrich behavior; or perhaps, in extreme cases, rearranging the deck chairs on the Titanic. Without a clear fix on the purposes of our training programs, how can we possibly evaluate whether they are sensible and successful, or determine what changes, if any, might be needed? Thus, we must ask "why" before we ask "what" and "how" Once we determine the overarching goal, we also need to ask related questions about specific program components. What are the intended effects of this component? How would we know whether it is achieving these intended effects? Are these effects consistent with the superordinate goal?

The Boulder Model and "Why"

For over half a century now, doctoral training in clinical psychology has been dominated in the United States by the Boulder model of scientist-practitioner training. The Boulder model's history is relevant to us because it sheds light on one answer to the "why" question. A detailed history is beyond the scope of this review, but readers can find useful accounts elsewhere (Baker & Benjamin 2000, Benjamin 2005, Benjamin & Baker 2000).

When the Boulder model was adopted in 1949, it represented a political compromise aimed at unifying the field. The impetus for the new model came primarily

from psychologists eager to expand the emphasis on practitioner training. The model's genius was that it was sufficiently general and inclusive to offer something for everyone. For the academics who wanted the Ph.D. in clinical psychology to remain a research degree, as was the case in the rest of psychology and the other sciences, the model declared that the first goal of doctoral training was to prepare all graduates for roles as scientists by emphasizing research training. At the same time, for those who wanted psychology to respond to the urgent need for clinical services following World War II and wanted to transform clinical psychology into a profession like medicine, the model also declared that a coequal goal of doctoral training was to prepare graduates for roles as professional service providers by emphasizing practitioner training. Science and practice were the model's dual goals—the model's hyphenated response to the "why" question.

The majority of contemporary clinical training programs still are based on the Boulder model, which now is over 55 years old. The model was designed at the dawn of the field, as we know it, to fit the special conditions that existed around the time of 1945 to 1949: the aspirations and expectations; workforce needs; economic conditions; academic structures; and ethical, theoretical, and scientific foundations of that time. Little was known then about the etiology of psychological disorders; there were no powerful pharmacological treatments for the major disorders; there were no empirically supported behavioral treatments; and patients with serious mental problems typically were institutionalized, often interminably. The Boulder model's founders could not have anticipated the field's evolution over the next fifty-plus years. Therefore, it is reasonable to ask, how well does the Boulder model fit the conditions and meet the needs of twenty-first-century clinical psychology? It would be remarkable, indeed, if the venerable model did not need extensive remodeling, if not outright replacement.

To put this into perspective, consider another model developed a few years after the Boulder model. In 1954, Rand Corporation scientists were asked to build a model of what a home computer might be like in 50 years—in 2004. They predicted that the technological problems would be solved within the next 50 years, but that computers would not be economically feasible for the average home. Their model of the 2004 computer filled one entire wall of a room. It had over 100 gauges, rows of dials and switches, two large steering wheels (perhaps precursors of the mouse), a huge television-like monitor, and a Teletype printer/keyboard. Clearly, Rand's engineers could not have conceived of laptop computers, such as the one I used to write this review.

The designers of the Boulder model would have found contemporary clinical psychology just as inconceivable. It is unreasonable to expect anyone to predict conditions 50 years into the future with accuracy. Thus, it seems strange that clinical psychology training programs continue to rely on a training model designed to fit the circumstances and meet the needs of a bygone era. The Boulder model has enjoyed a remarkably long run, but perhaps it is time to consider adopting newer models designed to fit today's realities.

THEN VERSUS NOW

Supply and Demand

The circumstances and needs faced by graduate training programs today differ dramatically from those in 1949. Back then, the subspecialty of clinical psychology as we know it was in its infancy; today, it is well past middle age. In 1949, for example, the total number of all Ph.D. psychologists in the United States was only about 4000. Today, more than 4000 doctoral degrees of various types are awarded in psychology each year. Clinical training now accounts for about half of these new psychology doctorates, a far greater percentage than in 1949.

The phenomenal growth in clinical psychology training programs was driven initially by the demand for mental health services following World War II. The need for psychologists to provide such services seemed so urgent that the United States Public Health Service and Veterans Administration offered grants and stipends in an effort to recruit psychology trainees. Psychology became an exciting new professional field, full of promise. As demand for clinical training grew, the number of programs offering doctoral training in clinical psychology grew in parallel, barely keeping up with the demand. By the 1960s, it seemed more difficult to get into a clinical psychology Ph.D. program than to get into medical school. It was projected, in jest, that if the growth rate in clinical training continued, everyone in the United States would have a Ph.D. in clinical psychology by the mid-twenty-first century.

By the 1980s, however, the demand for clinical psychologists started to lag behind the expanding supply. Recognizing that there no longer was a shortage of clinical psychologists, the government stopped providing training grant support for the doctoral training of clinical practitioners. By the 1990s, the Veterans Administration considered making a 50% cut in the number of doctoral-level psychology and support staff positions, possibly replacing them with outside consultants, most likely social workers (Sleek 1994). Psychologists in private practice began to have difficulty filling their appointment calendars and some experienced a downturn in income levels (Fyfe 1995). Despite these warning signs, the number of doctorates awarded in all areas of psychology continued to grow steadily, nearly doubling between 1970 and 2000 (APA Research Office 2005).

As psychology approached the twenty-first century, the disparity between supply and demand began to attract national attention. In 1991, a special section of *Professional Psychology: Research and Practice* was devoted to the workforce issue. Robiner (1991) dared to ask, "How many psychologists are needed?" and called for a national psychology human-resource agenda. Schneider (1991) warned that there were no magic workforce fixes in psychology's future. Pion (1991) and VandenBos et al. (1991) took a more sanguine view, counseling against overreacting. *Professional Psychology: Research and Practice* revisited the workforce issue in 2000 with another special section, in which Robiner & Crew (2000) called for "rightsizing the workforce of psychologists in health care" by adjusting training-program

enrollments, whereas Pion et al. (2000) countered that programs might retain their enrollments by expanding the scope and goals of their training.

By 2004, workforce problems had become critical. For example, there only were enough internship slots to accommodate 83% of the applicant pool in 2004–2005 (Association of Psychology Postdoctoral and Internship Centers 2005; R.K. Blashfield, personal communication), the worst ratio yet. This mismatch was due entirely to the growing applicant pool, as the number of slots remained remarkably stable. In November 2004, an APA Task Force on Workforce Analysis (2004) issued its final report, describing the problem's history and recommending funding for a full-scale workforce analysis focused not only on supply and demand, but also on needs. Essentially, the APA Task Force report was an important first step, in that it acknowledged that the workforce problem required attention, but it also was a disappointment, in that it merely recommended further study. The report's call for including a needs assessment was important, as all workforce analyses should begin with such an assessment. However, the report did not give specific questions that should be asked. For instance, to plan for the future of clinical training, we need to know the following: What are the specific needs that the workforce should be designed to serve? Is the current workforce training well matched to these needs, or might different training meet these needs more efficiently or effectively? For example, are there more cost-effective ways to meet these needs than by training doctoral-level psychologists? Psychology no longer can afford to ignore such questions. The longer we delay facing these critical workforce issues, the deeper the hole we will have dug for ourselves.

Roles

Another difference between 1949 and now is the change in clinical psychologists' roles. Prior to World War II, clinical psychologists primarily administered psychological tests and rarely administered psychotherapy. During the war, however, psychologists were allowed to function as independent psychotherapists to help meet the military's urgent need for mental health services. At the war's end, the medical profession (largely at psychiatry's behest) sought to restrict psychologists' freedom to continue practicing as independent psychotherapists. Once the genie had been let out of the bottle, however, there was no putting it back. Clinical psychologists, unwilling to return to their limited test-giver role, fought back, winning the right to continue practicing as independent psychotherapists and, over time, displacing psychiatrists as the primary providers of such services.

Today, this picture is changing once again: Social workers and mental health workers from other disciplines now are displacing psychologists as the primary providers of mental health services—doing to psychologists what psychologists did to psychiatrists earlier. The pace of this shift has been dramatic. In 1991, for example, social workers were providing only about 5% of all mental health services in the United States; by 1997 they were providing 56% of these services, and their market share was growing at an accelerating rate (Clay 1998). The simple

explanation for this shift is market economics: If you were the administrator of a mental-health-care system, were struggling to control costs, were aware of research showing no significant differences between psychologists and social workers in their effectiveness at delivering essentially the same services, and knew that you could hire nearly two social workers for the price of one psychologist, you probably would be hiring social workers, too.

State of the Science

A critical difference between 1949 and today is the state of science and technology. Changes over the past fifty-plus years have been amazing. Advances in computer technology, for example, have led to astounding developments throughout the sciences, from space exploration to weather prediction, from genome mapping to epidemiological mapping of disease transmission, from neural imaging to the creation of artificial language and virtual realities. Perhaps the most significant development in mental health care in the last half of the twentieth century is the development of so-called wonder drugs for major mental and emotional problems, such as schizophrenia, unipolar and bipolar depression, attention disorders, and anxiety disorders. Such drugs have led to a complete restructuring of the mental health system, transforming many classic state mental hospitals into historical artifacts.

More recent advances in behavioral and molecular genetics (e.g., Moffitt 2005), in cognitive science (e.g., Ashby & Maddox 2005), and in electrophysiological recording and electromagnetic imaging (e.g., Mukamel et al. 2005), along with developments at the intersections of such areas (e.g., Lang et al. 2006, Steinmetz 2006, Toga & Thompson 2005, Treat & Dirks 2006), promise to transform our grasp of the affective, cognitive, and neurobiological aspects of mental disorders, as well as our approaches to the prediction, prevention, and treatment of such disorders. New scanning technologies, for example, have opened exciting research and diagnostic frontiers and seem destined to supplant the use of neuropsychological tests for the diagnosis of brain lesions (Bigler 2005, Moritz et al. 2004). To ensure that students receive training at the rapidly expanding frontiers of this science, doctoral programs in clinical psychology cannot be wedded to tradition or be hamstrung by out-of-date requirements dictated by accrediting agencies or licensing boards. They must be sufficiently flexible and dynamic to evolve along with the science and technology, boldly going wherever the advances may take them.

Specialization and Integration

All doctoral students used to be trained first as psychologists, only secondarily as specialists. Today, specialization has become the focus of doctoral training in psychology. As knowledge and technology in a given area expands, mastering this material requires more intensive and extensive training. But this also leaves less time for learning material outside of the specialty. As a result, specialization has tended to balkanize psychology, with areas becoming increasingly insular

and narrow, so that persons working in one area often are unaware of advances in neighboring areas—advances that potentially could help them solve their own core problems. This balkanization has made psychological training more fragmented and less integrative, which almost certainly has impeded scientific progress.

To understand and solve clinical problems, students need integrative training that enables them to draw upon the best theories and methods throughout all of psychology—and all other relevant sciences—to solve their specialized problems. This truly integrative training cannot be assured by any standardized, one-size-fits-all approach to training. It is not assured, for instance, by the CoA's list of breadth requirements for program accreditation (APA Office of Program Consultation and Accreditation 2005), requirements too easily met by superficial survey courses. Nor will it be assured by establishing standard lists of "foundation, core, and specialty competencies" for education and credentialing in professional psychology, as advocated recently (e.g., Kaslow 2004). The proposed lists of such competencies are based on consensus opinion and tradition, not empirical evidence regarding training outcomes.

Is there any good way to ensure that students receive specialized training that also is integrative? Until recently, the answer seemed to be no. Specialization and integration seemed to be competing goals; thus, all pedagogical choices were difficult because they inevitably required compromises and trade-offs. Producing specialists, for instance, meant increasing the depth of training at the expense of breadth and integration; providing integrative training meant increasing the breadth of training at the expense of depth and specialization; and producing specialists who also were integrative meant increasing both the length and cost of training to unreasonable levels. In this past decade, however, new technological developments have brought to light a liberating new way of conceptualizing inquiry and training—a way that offers the potential of achieving both depth and breadth at a reasonable cost, thereby making it possible to train specialists who also are integrative.

These new technological developments and their implications are the focus of Friedman's (2005) best-selling book *The World Is Flat: A Brief History of the Twenty-First Century*. Friedman provides a compelling account of how digital and fiber-optic technologies have "flattened the world," or leveled the playing field, to give individuals everywhere a freedom to connect, communicate, and collaborate on a global scale; an unprecedented access to information; and a power to compete successfully, with minimal capital outlay, not only in commerce and geopolitics, but also in science, technology, and innovation. Whereas the world previously was organized vertically, controlled hierarchically, and driven by access to resources, this new world is organized horizontally, open and accessible, and driven by merit, making it more competitive and productive.

Friedman (2005) describes how this flattened world also is revolutionizing our knowledge structures and our approaches to learning and problem solving. The traditional authority-based, categorically structured, top-down approaches are being displaced by brashly egalitarian, flexible, irreverently hybrid, bottom-up

approaches. These new approaches ignore old rules and boundaries as they assemble large amounts of information from diverse sources in novel ways to create new solutions to old problems. The freedom of intellectual inquiry unleashed by these new technologies is symbolized by Internet search engines, such as Google, which empower individuals to access and manipulate an unprecedented amount and diversity of information on their own terms. In the past, high-level intellectual inquiry was reserved for the fortunate few with direct access to the special resources of elite institutions; moreover, such resources usually were difficult to navigate, and typically were structured in a fixed, hierarchical form. Now, almost overnight, such inquiry has become available to virtually anyone, anywhere in the world, who has access to a computer and an Internet connection. The new resource tools simplify navigation; invite independent, flexible, and novel exploration and discovery; and give individuals unprecedented freedom to search, filter, organize, and analyze the wealth of cross-linked, multidimensional information in unique ways that fit one's specific interests, questions, goals, and tastes at that moment.

This new technology—along with the diversity of players taking advantage of its flexible, just-in-time, hybrid, information-processing capabilities—signals a paradigm shift that promises to revolutionize intellectual inquiry, education, and training. This shift will force psychologists, along with everyone else, to rethink what it means to be an expert, or specialist, in a discipline; it also will force us to rethink our education and training systems—the methods by which we seek to transform novices into experts.

In the old paradigm, the primary role of experts was to serve as the storehouses and caretakers of discipline-specific information and formal knowledge structures. Our education and training systems were designed to allow these experts, the teachers, to share their storehouse of prestructured knowledge with novices, the students. For students to qualify as experts, they had to demonstrate that they faithfully and accurately stored these knowledge structures and that they were capable of retrieving and applying such knowledge independently. In contrast, under the new paradigm, the primary role of experts no longer is to store, retrieve, and disseminate information and knowledge structures, as this function is performed more reliably, effectively, and flexibly by the new tools of digital technology. Instead, expertise is redefined in terms of the skillful and creative use of the new technological tools to access the broadest possible range of relevant information; to generate new information; and to organize, evaluate, integrate, and apply this information in innovative ways to the analysis and solution of specifics problems within the discipline—and across disciplines.

The implications of this new paradigm for graduate education and training are just beginning to be appreciated. Although formal core courses still may be a reasonable way to transmit the basic outlines of established knowledge structures, they probably are no longer the most efficient or effective way to impart factual information. Traditional courses still may be useful for fostering collegiality, giving trainees a shared perspective, modeling critical thinking, shaping ethical values and judgments, or encouraging oral communication, discussion, and debate. But

the new paradigm invites us to start with a blank sheet of paper and redesign our training programs, first building a prioritized list of explicitly stated training goals, then critically examining all available methods of achieving each goal, and finally choosing the most efficient, effective, and workable options. No goal or method should be adopted uncritically. The final design should be driven less by concerns about standardization and external requirements—concerns that tend to foster conventionality and squelch independence and innovation—than with empowering each student to flourish as an innovative, uniquely hybrid, collaborative, productive, and integrative specialist.

This paradigm shift could not have come at a more opportune time. Today, psychology departments are retrenching as they face increased costs, tighter budgets, and slower growth (even declines) in enrollment. In this competitive environment, clinical training programs no longer are assured of the favored status and resources they have enjoyed for so long. As clinical psychology's halcyon days recede into memory, clinical training programs must recognize that their long-term survival depends on their reintegration with the rest of the field. This means providing clinical students with training at the cutting edges of psychological science—neuroscience, cognitive science, quantitative modeling, genetics, psychopharmacology, and developmental and social processes. The programs should invite students from these other areas to apply their expertise in basic psychological processes to the investigation of important clinical problems. It is time to drain the moat that has protected but isolated clinical training programs over the last half century. Indeed, the National Institute of Health's translational research initiative (Cuthbert 2006, National Institute of Mental Health 2000) is a direct reflection of clinical psychology's future hinging on its success in developing this bidirectional integration and cross-fertilization.

Accreditation and Licensing

There also are important differences between 1949 and now in the degree of regulatory control over the training of clinical psychologists and over the practice of professional psychology. Clinical psychology was just getting organized as a profession in 1949. The first 29 doctoral training programs in clinical psychology were accredited by APA in 1948, with another six programs accredited in 1949. By 2005, 227 doctoral training programs in clinical psychology were accredited by the CoA (APA Office of Program Consultation and Accreditation 2005), 112 of which had been accredited for the first time since 1980. This means that nearly half of all currently accredited doctoral training programs in clinical psychology became accredited only after the demand for doctoral-level clinical psychologists had started to fade.

Of course, the CoA accredits other types of practitioner training in psychology, not just clinical programs. The first doctoral training programs in counseling psychology were accredited in 1952; by 2005, 73 counseling programs were accredited. The first doctoral program in school psychology was accredited in 1971;

today, 57 such programs are accredited. There now are 11 accredited doctoral programs in combined professional-scientific psychology, the first dating back to 1973. In addition, the CoA currently accredits approximately 450 predoctoral internship training programs and 22 postdoctoral training programs. Accreditation has become a big business—an essential part of doctoral training—that exerts a powerful constraining influence on the design of training programs.

Dissatisfaction with CoA accreditation requirements, particularly their perceived infringement on academic prerogatives, led to a 1992 summit on accreditation in Chicago devoted to discussing the problems and considering alternatives. A steering committee was formed to draft plans for an alternative accreditation system. By January 1994, when these draft plans were completed, the CoA had revised its own guidelines and procedures in an effort to address the complaints, so the alternative system never was implemented. By June 2005, however, dissatisfaction with the revised CoA accreditation system led to another summit on accreditation in Snowbird, Utah. This recent summit produced a proposal calling for significant modifications in the existing accreditation structure (Schilling & Packard 2005). Meanwhile, other proposals for system change have been floated by other sources, including the CoA itself. The current accreditation system is likely to be modified in the near future, although the specific details of the changes still are fuzzy.

In 1945, Connecticut was the first state to license the practice of psychology, but licensing laws did not become common until the 1960s. Now, all 50 states have such laws, with the last state, Missouri, passing its law in 1977. The specific provisions of these state laws vary, but the laws impose another layer of regulation on the design of doctoral training programs.

Many Boulder model programs regard the regulatory aspects of accreditation and licensing as unwelcome encroachments on their academic freedom and impediments to their ability to provide doctoral training of the highest quality. These frustrations are reflected in the resentment expressed by members of the Council of University Directors of Clinical Psychology during the substantial portion of their annual midwinter meeting that is devoted to discussions of accreditation and licensing issues, rather than to more important substantive issues related to science and training.

Organization

From 1949 to 1988, the APA was the only major professional organization representing all facets of psychology—its science, practice, education, training, and public relations. In 1988, APA's monolithic control was challenged when a group of disaffected psychologists—mostly academics, including many clinical psychologists—broke away from APA to establish a new, competing organization, the American Psychological Society (APS). APS is dedicated exclusively to advancing psychology as a science and is committed to reestablishing research training as the preeminent focus of all doctoral training. Thus, APS's answer to

the "why" question differs from APA's answer; the goal of training for APS is to train research scientists, whereas the goal of training for APA is to train scientist-practitioners. This 1988 split ran along fault lines that existed since before 1949—divisions that the Boulder model's compromise had sought to patch and bridge, but that never had disappeared.

Today, both APA and APS are thriving organizations, each with a different structure and emphasis; each representing overlapping yet distinct constituencies; each with its own vision of psychology's future; and each attempting to mold psychological research, practice, and education to its particular vision. The existence of the two organizations means that individual psychologists, as well as doctoral training programs, have choices today that did not exist 20 years ago. It also means that individuals and programs must make choices and assume responsibility for the consequences.

Doctor of Psychology Training

In addition to having a choice of organizations and visions, today's clinical training programs also have choices of training models. One option—which did not exist in 1949—is the training model associated with the doctor of psychology (Psy.D.) degree. The Psy.D. degree became the first significant challenge to the Boulder model's hegemony over clinical training. The degree's roots can be traced to the University of Illinois' short-lived Psy.D. program, which began in 1969. The Psy.D. training model received a boost from the 1973 Vail Conference, which was devoted to developing and promoting the model (Korman 1974). Yet, by the end of the 1970s, only four Psy.D. programs, all housed in universities, had been accredited by the APA. The Psy.D. movement began to gather momentum in the 1980s, however, with the rapid growth of "freestanding" or "independent" Psy.D. programs—i.e., programs not located in psychology departments of traditional universities. Fourteen Psy.D. programs were accredited in the 1980s, 22 in the 1990s, and another 17 from 2000 to 2005.

It is ironic that practice-oriented psychologists were the first to break away from the traditional scientist-practitioner training model. Research-oriented academics seemed to be the most vocal critics of the Boulder model over the years, complaining that the demands of practitioner training interfered with first-rate research training. Yet, practice-oriented psychologists were the first to defect, complaining that the Boulder model's research training requirements interfered with first-rate training for professional practice. They also worried that the philosophy of science taught in traditional Ph.D. programs was misguided, failing to provide genuine solutions to real-world clinical problems.

In general, Psy.D. programs are committed to the "scholar-practitioner" model of training (sometimes also referred to as the "practitioner-scholar" model). This model's goal—its answer to the "why" question—is "to train professional practitioners." Research training is minimized; Psy.D. students are taught to be consumers of science and "local clinical scientists" but not to be producers of

traditional research science. The aim is to free trainees from the rigors of research training—training that the model's proponents say most of these students would be unlikely to use after graduation anyway—so that more time can be devoted to training them for professional practice. In theory, this additional training should produce superior practitioners. (For more detail on the history, goals, rationale, and philosophy of Psy.D. training, see Peterson 2003, Peterson et al. 1997, Peterson & Trierweiler 1999, and Stricker & Trierweiler 1995.)

The growth in Psy.D. training over the last 25 years has been startling. Today, Psy.D. programs account for nearly 30% of all doctorates awarded in psychology and 42% of the health-service doctorates in psychology. As noted above, the number of doctorates awarded in all areas of psychology has grown steadily. In recent years, however, this growth has been almost entirely a result of the expansion of Psy.D. training. From 1988 to 2001, for instance, the production of Ph.D.s has remained essentially level, whereas the production of Psy.D.s has increased by 169% (APA Research Office 2005). The National Council of Schools and Programs of Professional Psychology (2005), the training council for the scholar-practitioner model, had 74 member programs in 2004, 57 of which were accredited by the CoA as doctoral programs, nearly all in clinical psychology. Although these programs usually award a Psy.D. degree, some may offer a Ph.D. degree option to students who complete "scholarly" dissertations (not to be confused with empirical research dissertations).

Do the orientations and degree distinctions associated with training models really matter or signify anything important? The following evidence, distilled from several sources (APA Research Office 2005, Maher 1999, Norcross et al. 2004a, Peterson 2003, Yu et al. 1997), suggests that they do. Psy.D. programs are less selective in their admissions than university-based Ph.D. programs. The mean acceptance rate in independent Psy.D. programs is 50%, and as high as 80% in some cases, with a mean class size of 48; in all types of Psy.D. programs combined, the means are 41% and 33, respectively. In contrast, in research-oriented Ph.D. programs, the same means are 11% and 9, respectively; in Ph.D. programs with scientist-practitioner or practitioner orientations, the means are 17% and 10, respectively. Students admitted to Psy.D. programs have lower mean GREs and undergraduate GPAs than those admitted to the Ph.D. programs. The Psy.D. programs with the least distinguished faculties produce a disproportionately higher percentage of all the doctorates. Psy.D. programs generally have a lower mean percentage of full-time faculty members, with a higher mean student/faculty ratio—nearly double that of university-based Ph.D. programs. The financial support levels are lower and the costs are higher in Psy.D. programs than in Ph.D. programs. Psy.D. students carry significantly heavier student-loan debts than Ph.D. students. Yu et al. (1997) found that when graduates from Psy.D. programs sit for state licensing exams, they earn lower mean scores on the standardized test than graduates from Ph.D. programs.

Of course, these data are correlational, so cause and effect are tangled hopelessly, making inferences difficult. Nevertheless, these differences are so

worrisome that Peterson (2003), an architect of the Psy.D. movement, has expressed serious concerns about the quality of the training provided by many Psy.D. programs. Although other reviewers less closely aligned with the Psy.D. movement had raised similar concerns previously, Peterson's criticisms struck a nerve with proponents of Psy.D. training, prompting a rash of rebuttals and defenses (e.g., Crossman et al. 2004, Jaffe 2004, Kenkel et al. 2003. In general, it seems fair to conclude that the current evidence on Psy.D. training, although far from definitive, does not paint a favorable picture.

Despite such evidence, Psy.D. programs continue to attract large numbers of applicants and produce disproportionately large numbers of doctorates. The sheer number of graduates from Psy.D. programs has contributed to the growing disparity between supply and demand in the workforce. The Psy.D. training model, as a competitor to the Boulder model, has altered the landscape of doctoral training and practice in clinical psychology, with graduates from Psy.D. programs exerting a significant and growing political influence within APA and within clinical psychology. Their epistemological perspectives—i.e., their rules of evidence or ways of knowing truth—increasingly are presented as challenges to the traditional epistemological perspectives taught in most traditional training programs. Their vision of clinical psychology's future, which differs from the traditional vision, seems to be gaining influence in some circles.

Clinical Science Training

Today, the Psy.D. training model is not the only challenger to the traditional Boulder model. In 1995, another perspective on clinical training—a third major way of answering the "why" question—crystallized, with the founding of the Academy of Psychological Clinical Science (also known as the Academy), an association of U.S. and Canadian doctoral training programs in clinical and health psychology. The Academy celebrated its tenth anniversary in May 2005, with 54 member programs—45 university-based Ph.D. training programs and nine predoctoral internship training programs. For these Academy programs, the preeminent goal of doctoral training in clinical and health psychology is to prepare students for careers as clinical scientists. Thus, the primary emphasis in these programs is on research training. According to the Academy's mission statement (Academy of Psychological Clinical Science 2005),

> "Clinical science" is defined as a psychological science directed at the promotion of adaptive functioning; at the assessment, understanding, amelioration, and prevention of human problems in behavior, affect, cognition or health; and at the application of knowledge in ways consistent with scientific evidence. The Academy's emphasis on the "science" underscores its commitment to empirical approaches to evaluating the validity and utility of testable hypotheses and to advancing knowledge by this method. . . . The Academy sees the development and application of clinical science as ongoing and dynamic processes, and is committed to facilitating the evolution of clinical science.

The Academy has established specific goals in five areas: (*a*) "Training: To foster the training of students for careers in clinical science research, who skillfully will produce and apply scientific knowledge"; (*b*) "Research and Theory: To advance the full range of clinical science research and theory and their integration with other relevant sciences"; (*c*) "Resources and Opportunities: To foster the development of, and access to, resources and opportunities for training, research, funding, and careers in clinical science"; (*d*) "Application: To foster the broad application of clinical science to human problems in responsible and innovative ways"; and (*e*) "Dissemination: To foster the timely dissemination of clinical science to policy-making groups, psychologists and other scientists, practitioners, and consumers." (For more on the clinical science model, see McFall 2006.)

Although the Academy is a relatively new organization, the clinical science model, with its focus on training research scientists, is not new. A major faction at the Boulder conference had argued that science training should be the central goal of all doctoral training in psychology and had opposed the move toward professional practice training on grounds that this almost certainly would undermine the science training. Woodworth (1937) had raised such concerns long before the Boulder conference. Today, many research-oriented psychologists believe that history has proven that these concerns were warranted (Sechrest 1992).

Comparisons Among Training Models

The sharp differences among clinical psychologists in terms of their visions, values, and goals are not new; these have been simmering beneath the surface since before the Boulder conference. Now that these differences are out in the open, however, it is difficult to maintain a public pretense that clinical psychology is a homogeneous, unified field. Today, doctoral programs must choose from among three distinct training models (i.e., scientist-practitioner, scholar-practitioner, clinical scientist) when applying for accreditation. The CoA regards each model as a legitimate framework for accreditation but expects to find truth in the advertising: Once a program declares its model, it must demonstrate that its training content and outcomes are consistent with this model.

Comparisons of data for training programs identifying with the different training models show differences not only in stated philosophies and goals, but also in activities and outcomes. For example, Cherry et al. (2000) found that the faculties and students at clinical science programs are more actively involved in research than the faculties and students at scientist-practitioner programs, who, in turn, are more active than the faculties and students at scholar-practitioner programs. Moreover, they found that clinical science faculties publish more journal articles and give more presentations than scientist-practitioner faculties, who do more of these things than scholar-practitioner faculties. The same pattern characterizes the students in the three models. The faculties at scholar-practitioner programs

engage in more service delivery than the faculties at scientist-practitioner programs, who provide more service than the faculties at clinical science programs. Interestingly, scientist-practitioner students provide the most service, whereas scholar-practitioner students provide the least, with clinical science students in the middle.

Cherry et al. (2000) reported that the five most common work settings for graduates from the three types of programs are as follows:

1. Scientist-practitioners: medical center (18%), CMHC (15%), hospital (14%), postdoc (13%), and academic (11%).

2. Scholar-practitioners: CMHC (25%), other/multiple (23%), and medical center, hospital, private practice (12% each).

3. Clinical scientists: academic (29%), medical center, hospital, private practice (13% each), and postdoc (9%).

Training models do seem to make a difference, although we must be cautious about drawing causal inferences from such correlational data.

THE CHANGING FACE OF CLINICAL PSYCHOLOGY

Forces of Change

In an enlightening book, Yale political scientist Rae (2003) traces the history of New Haven, Connecticut, using the city's rise and fall to illustrate a general thesis that the fate of all cities is determined largely by economic, physical, and social forces beyond the control of local governments. Local politicians may act as though their decisions shape the future of their cities, but the outcomes actually are governed by other forces usually perceived clearly only in hindsight. Rae offers a compelling account of the influence exerted by forces such as geography; transportation systems; access to energy, labor, and capital; technological developments; changing workforce demographics and skill requirements; and the unintended consequences of governmental programs, such as zoning, subsidized housing, urban renewal, and freeway construction, all designed to fix city problems. This is a thought provoking, humbling analysis.

A similar analysis of clinical psychology's history would suggest that external forces are shaping the mental-health-care system and, consequently, the future of doctoral training in clinical psychology. Psychologists may act as though they control their future, but in the long run, the tug-of-war among the different training models, with their differing answers to the "why" question, will not be decided by debates or internal political struggles; the outcome will be determined, instead, by major forces operating outside of psychology, forces over which psychologists have little or no control. These forces are reshaping the world in which clinical psychology and doctoral training are embedded. For clinical psychology to survive, it must adapt to these forces and the new world they are creating.

Managed Care

The most powerful force in the last 25 years—a 600-pound gorilla that cannot be ignored—has been the advent of managed care, with its shift from a fee-for-service model to a managed-care model of health-care delivery, its insistence on accountability and evidence-based decisions, and its focus on cost control. Indeed, the managed-care movement is driven primarily by economic concerns, especially the urgent need to control the skyrocketing costs of health care. Although mental health care accounted for less than 10% of all health-care costs and was not the primary target of the reforms, managed care's impact on mental health care has been dramatic. Under managed care, mental health's share of the total health-care budget has shrunk, and psychology's piece of that shrinking pie has decreased at an even faster rate (Bickman 1999).

Implications of Managed Care

In my review of professional practice literature from the past 15 years, two themes stood out, both reflecting practicing psychologists' angst over uncertain professional futures. The first theme is the widespread distress over managed care's impact on traditional clinical practice. Initially, this was expressed in articles attacking managed care (e.g., Karon 1995, Seligman & Levant 1998), but these attacks soon gave way to articles offering advice on how to survive in a managed-care world (e.g., Cummings 1995, Rupert & Baird 2004). Psychologists gradually seem to be absorbing that managed care is a major force not likely to disappear any time soon, even though they still are not sure what to do about this.

The second theme is the search for new, alternative roles for psychologists (e.g., Levant et al. 2001, Perrott 1998, Reed et al. 2001). To illustrate the scope of envisioned possibilities, the following is a small sample of the proposed new roles: write prescriptions, provide primary health care, conduct physical exams, engage in profiling/detective work, provide infant care, engage in political activism, train third-world providers, provide distributed or online education, conduct Internet therapy, offer end-of-life care, do risk evaluations for courts, provide telehealth services, serve as psychologist-legislators, offer genetic counseling, practice in schools, provide antiterrorism policy consultation and service, act as trial consultants, engage in medical crisis counseling, offer entrepreneurial "niche" psychology, and provide psychological services to businesses.

APA has responded to the challenges of managed care by encouraging its members, governmental officials, and the public to adopt a more expansive conception of psychological education and practice. One prominent example has been APA's lobbying effort to persuade states to adopt laws granting prescription privileges to psychologists. The same economic logic that helped social workers displace psychologists as the primary providers of traditional mental health services—the logic of cost-effectiveness analyses—has given life to psychologists' hopes of displacing psychiatrists as the writers of prescriptions for psychoactive drugs. This may be a slim reed, however, as primary care physicians currently write over 80%

of all such prescriptions, leaving a small market share for psychologists to capture from psychiatrists. Nevertheless, these lobbying efforts have made some headway, despite a heated debate within psychology about the merits of this gambit and its potential negative impact on doctoral training, the field more generally, and public health (Heiby 2002; Heiby et al. 2004; Robiner et al. 2002, 2003).

In general, psychologists seem to be recognizing, at some level, that as the world changes around them, they also must change. Unfortunately, none of the articles describing potential new roles for psychologists gave much consideration to how these roles might relate to doctoral training, nor did the articles provide empirical evidence that (*a*) the new roles were in response to genuine needs, (*b*) psychologists were either qualified or the most logical choices to fill such roles, or (*c*) psychologists actually had cost-effective services that they could deliver in such roles. Just because someone can identify a need does not mean that the person can do anything effective to meet that need.

The articles encouraging psychologists to invent new roles for themselves were a bit disconcerting. Psychology's track record for managing its traditional roles in clinical assessment and intervention has been spotty. Practitioners too often have disregarded the scientific evidence on assessment (Garb 2005), ignored clinical practice guidelines (Phillips & Brandon 2004), and neglected to monitor their treatment outcomes (Lambert & Hawkins 2004). Doctoral training programs and internships too often have failed to ensure that trainees are competent in empirically supported therapies (Crits-Christoph et al. 1995). So why should psychologists be entrusted to tackle new roles for which they were not trained, about which they know little, and for which there is little empirical research support?

The advent of managed care has profound implications for the future of professional practice in clinical psychology. As noted above, it already has transformed the workforce, with clinical psychologists being displaced as the primary providers of mental health services and with over 40% of currently employed psychologists working in positions not directly related to psychology. The demand for doctoral-level clinical psychologists trained primarily for careers as practitioners is declining, with little likelihood that this trend will be reversed or offset in the future. Meanwhile, the number of psychologists trained for these careers continues to increase. Consequently, the career prospects for practitioners currently employed may not look too bright, but for those not yet in the workforce who hope to become clinical practitioners, the prospects seem dimmer.

The implications of managed care for doctoral training in clinical psychology are no less significant: Given the workforce changes wrought by managed care, there is less justification for continuing to train doctoral-level clinical psychologists for careers as practitioners. Given the imbalance between supply and demand, there also is less justification for continuing to train the same number of doctoral students as in the past. Most research-oriented programs already admit small classes because research training is individualized and labor intensive; these programs have "rightsized" naturally. However, doctoral programs training large numbers of students should admit fewer students, as Robiner & Crew (2000)

advised. In general, too many doctoral programs in clinical psychology provide training for which there is less demand or need. Of course, if the scale of doctoral training were adjusted to more appropriate levels and the training goals became more focused and realistic, this would lead to cascading changes in internship programs, postdoctoral training programs, and psychology departments. All of these changes would be tough pills to swallow, but they may be necessary medicine for the long-term health of the field.

Positive Implications?

Amid the gloom over the impact of managed care, some psychologists—myself included—see a possible silver lining. A major by-product of the managed care movement has been its increased emphasis on cost-effectiveness, accountability, and quality control. Admittedly, these concepts have not always been applied in principled ways, which has led to some bad decisions and unhappy results. However, in principle these concepts are congruent with psychology's traditional scientific values and, hence, should be welcomed by psychological scientists. I have argued, for example, that mental-health-care decisions and practices should be based on the best scientific evidence, providers should be held accountable for delivering the most cost-effective services available, continuous quality improvement should be built into all mental health delivery systems, and all doctoral training in clinical psychology should be guided by these principles (McFall 1991, 1996, 2000; Rotter 1971; for an opposing view, see Peterson 1996). From my perspective, managed care's attention to data-driven, science-based approaches represents a long-overdue development. If embraced by psychology, this could serve as a positive force behind clinical scientists' push to improve the scientific foundations of mental health care and doctoral training in clinical psychology.

A prime example of this push is the campaign to identify and promote empirically supported clinical practices, launched in the mid-1990s by David Barlow, then president of Division 12 of APA. He formed the Task Force on the Promotion and Dissemination of Psychological Procedures, chaired by Chambless (1995), and asked this group to review the empirical research literature on clinical interventions and identify those procedures supported by a reasonable body of evidence. The task force subsequently generated a series of reports and updates (Chambless et al. 1996, 1998; Chambless & Ollendick 2001), which have provided a framework for promoting accountability in clinical practices and increasing attention to the scientific foundations of intervention training in doctoral programs.

This effort to promote empirically supported treatment (EST) has met with growing opposition from some quarters of psychology, including the president of APA (Levant 2004). It is a lively debate that shows no sign of subsiding (see Crits-Christoph et al. 2005; Weisz et al. 2005; Westen et al. 2004, 2005). In fact, the leadership of APA recently added fuel to the fire. It has attempted to counter and co-opt the EST movement by reframing the issue in a less rigorous way, under the label of evidence-based practice. APA president Levant formed the Presidential

Task Force on Evidence-Based Practice, which issued its final report in July 2005. The report was approved as official APA policy by the APA Council of Representatives in August 2005 (APA & Levant 2005). With this action, APA appears to have fired a shot across the bow of the EST movement. Essentially, APA has taken the position that the EST movement's definition of evidence is too narrow and restrictive, giving too much weight to experimentally controlled randomized clinical trials while failing to give sufficient weight to other factors, such as clinical experience or patient characteristics, values, and context. Ultimately, the outcome of this ongoing EST–evidence-based practice- battle is likely to be determined by outside forces, such as demands for cost-effectiveness, accountability, and treatment specificity, rather than by psychologists' internal debates, task force reports, or policy statements.

Implications of a Science-Based Approach

Most psychologists claim to be scientists, or at least claim to be "scientifically minded." If these claims were true, should not the design of clinical psychology doctoral training programs be dictated by the best scientific evidence, or at least be consistent with this evidence? (As we have seen, psychologists do not agree on the definition of "best scientific evidence," but we set that problem aside for the moment.) Are the designs of today's training programs consistent with the scientific evidence?

To explore this question, let us examine the degree to which today's programs are consistent with the scientific evidence summarized by Bickman (1999). After thoroughly reviewing the research evidence, Bickman concluded that six common beliefs among clinical psychologists are myths. Specifically, he stated that it is a myth to believe that effective mental health services are assured by (*a*) clinical experience, (*b*) degree program training, (*c*) continuing education, (*d*) licensing, (*e*) accreditation, or (*f*) clinical supervision. If clinical psychologists were to take Bickman's conclusions seriously and act accordingly, what implications would this have for doctoral training and mental health practice?

First, let us consider the mythical belief that doctoral training increases the effectiveness of clinical service providers. If persons with master's or bachelor's degrees, or perhaps with no degree at all, might do as well as those with Ph.D.s or Psy.D.s at delivering the same services, perhaps doctoral programs should stop admitting applicants who are interested primarily in careers as practitioners, admitting only those applicants interested in research training for careers as scientists.

Second, let us consider the mythical belief that the amount of supervised clinical experience enhances the effectiveness of a provider's clinical services. If neither the quantity of clinical experience nor the amount of clinical supervision is correlated with effectiveness, perhaps doctoral programs should stop emphasizing the importance of accumulating a large number of supervised practicum training hours, redirecting these valuable and scarce resources to offering more extensive, individualized, specialized, and integrative training in scientific research.

Third, let us consider the mythical beliefs that program accreditation, professional licensing, and continuing education requirements are additional ways to enhance clinical effectiveness. If these elements are nonessential, perhaps they could be given less weight in doctoral training programs. Imagine the resources that could be redirected to improving the science training. From this perspective, a great deal of our contemporary clinical training seems to be misguided, to have achieved a state of functional autonomy, which brings us full circle. Like the motorcyclist, we should ask ourselves, Why ARE we still doing these things?

BLUEPRINT FOR THE FUTURE OF CLINICAL TRAINING

What should clinical psychology doctoral training programs do, and how should they do it? With these questions, we move from description to prescription. Here is a list of suggestions, which I consider to be at least consistent with the above analysis, if not derived from it directly.

Scientific Clinical Psychology

Above all, clinical psychology should be a psychological science. Aside from its distinctive focus on clinical problems, it should be indistinguishable from the rest of psychological science. Clinical psychology simply is the psychological science subarea concerned with advancing knowledge regarding the origins, assessment, prediction, and promotion of mental and behavioral health. In all respects, clinical psychology should be integrated fully with the rest of psychological science, as well as with all other relevant sciences. The level and integrity of the science in clinical psychology—i.e., respect for, reliance on, and contributions to scientific theory, knowledge, principles, and methods—should be at least equal, if not superior, to the high quality found in the rest of psychology. Anything less should be unacceptable. We should strive for increased rigor, not look for ways to soften scientific standards so that we can continue with business as usual.

Clinical Psychology as an Applied Science

Because it is an applied science, committed to improving the human condition, clinical psychology has an ethical responsibility not only to avoid doing harm, but also to avoid acting in self-interest. The welfare of those in need always must come first, even if this requires a personal sacrifice, such as a loss in income or role. Clinical psychologists should do whatever is required to promote the most efficient and cost-effective mental-health-care system possible, as determined by the best scientific evidence available—defined as rigorously as possible. They should not be preoccupied with protecting their jobs as health-care providers. Indeed, it was a mistake from the outset of the field to equate scientific clinical psychology with professional practice careers. Clinical psychology should be about pursuing knowledge and truth, and using this knowledge to solve problems; it should not

be about enhancing the professional guild. As scientists, we must be prepared to follow the scientific evidence wherever it takes us, evolving along with the science, rather than clinging to past ideas, methods, or roles. This is a principled course of action by which clinical psychology is most likely to make enduring contributions to the advancement of mental and behavioral health; in the process, it also is most likely to remain a vital, valid, and flourishing field.

The Goal of Doctoral Training

The preeminent goal of all doctoral training in clinical psychology should be to train research scientists. The focus should be on ensuring that trainees acquire the necessary knowledge and skills to make important contributions to the advancement of our science and to the application of this science to the solution of mental and behavioral health problems. Programs should concentrate on what they do best—training research scientists. Moreover, investing in research training promises to yield the best returns over time. Research training has set clinical psychologists apart from all others in mental health; increasingly, this research expertise represents the most significant and distinctive value-added contribution clinical psychologists can make to mental health. Doctoral programs should build on this special strength, which offers the most solid foundation for clinical psychology's future.

For all the reasons I review in this chapter, the future does not look bright for doctoral-level clinical psychologists trained primarily for careers as mental-health-care providers. Only one of the three leading doctoral training models—the clinical science model—seems to fit the needs and current realities in mental health under managed care. It is the only model in which training practitioners is not a goal, the only one focused exclusively on training research scientists. The clinical science model makes the most efficient use of scarce training resources and offers the best hope for clinical psychology's future, both in terms of the integrity of the doctoral training provided and the likelihood that graduates will be prepared to make significant and enduring contributions to advancing mental and behavioral health.

Training Research Scientists

To design efficient and effective research training programs, we need to start with a blank piece of paper, skeptically examining all aspects of training: the high school and undergraduate background; recruitment and selection of trainees; pedagogical philosophy and training methods; content and curriculum; performance evaluation; mentoring systems; experience with clinical populations, problems, and methods; ethics; research and grant support; written and oral communication; sensitivity to generalizability issues; creativity and cross-fertilization; technical competence; etc. In each case, training components should be added to the design only when the logic and evidence are compelling. The aim should be to make the program as streamlined, efficient, focused, flexible, and integrative as possible, exploiting fully

the new paradigm growing out of recent developments in digital and fiber-optic technology.

Unfortunately, there is little solid research on how to train research scientists (Klahr & Simon 1999). Nevertheless, a number of clinical science training programs can point to outcome data showing that they have been successful. We first need to investigate how they have done this. Then, in the spirit of continuous quality improvement, we need to ask how it can be done even better in the future. We should not expect standardization in training; there undoubtedly are multiple ways to achieve similar positive outcomes. Essentially, we need to "reverse engineer" exemplars of successful training, looking for factors that might have contributed to the desired outcomes: e.g., analyze the designs of successful clinical science programs, study the training histories of outstanding clinical scientists (Levenson 2004), and study the methods of research mentors with exceptional records of training outstanding scientists over the years. These steps should help generate hypotheses, but such anecdotal case-study methods are of limited value. We must collect data, systematically testing our hypotheses about effective research training.

Individualized, Integrative Training

Most successful research training programs rely on an apprenticeship model, in which trainees work closely with a research mentor, conducting programmatic research on specific problems. This type of training tends to be intensive, focused, and integrative. It also tends to be highly individualized, relying less on standardized checklists of formal courses, more on direct lab experience, an "as needed" approach to the acquisition of knowledge and skills, and the inquisitive pursuit of answers to puzzles raised by unexpected results. It is not a paint-by-the-numbers approach to training; it is not concerned with coloring inside the lines; it clearly differs from the superficially broad and general training found in programs concerned with standardization and satisfying external requirements.

Successful mentorship training ensures the acquisition of a broad range of specific knowledge and skills, with the configuration dictated by the demands of the particular problems being investigated. One trainee, for instance, might need to become an expert psychopathologist, psychophysiologist, developmentalist, behavioral geneticist, computer programmer, electrical engineer, mathematical modeler, grant writer, ethicist, article writer, assessor, and therapist for anxiety disorders. Another trainee might need to develop equally deep expertise in a different set of content and technical areas to pursue a different research problem. All decisions about which skills and knowledge a trainee needs flow naturally from the trainee's choice of research problems and theoretical approaches to investigating those problems. Although no two trainees in such mentorship programs may acquire exactly the same sets of skills and knowledge, there inevitably are commonalities and overlap. Trainees not only will take a limited number of foundation courses, but they also will be encouraged to share the conceptual and methodological

details of their individual work through colloquia, seminars, posters, tutoring, and shared problem solving. Such programs are designed to ensure that every trainee emerges with the requisite qualifications and competencies to succeed as a scientific contributor in his or her problem area. At the same time, these programs are designed to ensure that trainees learn more generally how to carry out independent programmatic research on specific cutting-edge problems. With this higher-order knowledge, graduates will not be stuck in a narrow niche, capable of pursuing only one problem, but will be prepared to pursue a variety of research problems throughout their career.

What Not to Do

We also can list things clinical science programs should not do. For example, while recognizing that trainees should have reasonable prospects for employment following graduation, doctoral programs should not be vocational schools, preparing students narrowly for specific jobs. Instead, they should aim to train research scientists capable of filling a variety of roles—not only roles as faculty members in doctoral programs or medical schools, but also roles as designers and evaluators of new assessments and interventions; roles as program evaluators or administrators in health-care settings; roles in health-policy research, education and training, and research supervision; or roles in any number of other areas that make good use of their research expertise.

Clinical science programs should not emphasize practitioner training, worry about students' accumulation of supervised clinical hours, or allow the program's content and structure to be driven by accreditation and licensing requirements that interfere with the program's primary goals. This does not mean that clinical science programs should provide no training in clinical assessment and intervention. Rather, the design of such training (as with all the training) should be dictated entirely by its intended purposes, not by traditions and myths. For example, a clinical science trainee investigating a specific psychological disorder, such as schizophrenia, surely must have first-hand knowledge of that disorder and a solid grounding in the best available assessments and interventions for that disorder. However, such knowledge and grounding might be achieved in a variety of ways, not always through clinical practicum experiences or formal coursework; it might be achieved, instead, through individual tutorials, independent study of training manuals, or involvement in research. The trainee's competence in targeted areas should be assessed directly through performance samples, not indirect measures with questionable validity, such as the number of supervised clinical hours or the number of tests administered. Trainees pursuing clinical research problems for which traditional therapy skills may be less relevant (e.g., molecular genetics studies of bipolar depression) should not necessarily be expected to demonstrate high competence in traditional skills; instead, they might spend their time more productively mastering skills more relevant to their research problem. In short, we should not take a cookie-cutter approach to doctoral training in clinical psychology.

Sharpening Versus Leveling

Finally, it is time for clinical scientists to rid themselves of the burdensome ball-and-chain myth that clinical psychology is a homogeneous, unified field. Clinical scientists need to become sharpeners rather than levelers, emphasizing the key differences found in clinical psychology today rather than minimizing or ignoring them. Many such differences are described in this review. It is time to stop pretending, for example, that the graduates of various doctoral training programs have more commonalities than differences. It is time to declare that all ideas, theories, and methods are not created equal and do not deserve equal consideration. It is time to declare that the different training models, with their discrepant goals, values, and content, are not equally defensible; all epistemologies are not equally reasonable; all types of evidence are not equally valid and informative; and one's choices among all the various options in clinical psychology are not simply a matter of personal taste.

As long as potentially important differences are obscured through leveling, it is impossible to determine which differences, if any, actually are critical to the outcome. In the end, some differences may not matter, but the only way to find out is by starting with the assumption that they might be important and then empirically ruling out this possibility. This skeptical sharpening is at the heart of scientific thinking and research training. We must model this kind of thinking for our students by critically examining our doctoral training programs in clinical psychology. After all, these students represent the future of our field. To ensure that clinical psychology is in good hands, we must teach them to ask the critical questions. Once again, "Why ARE we doing this?" Surely we can do better.

At the beginning, I stated that doctoral training in clinical psychology stands at a crossroads, faced with difficult choices for its future. We cannot afford to be complacent, to continue with business as usual. I explained why we must become self-critical, analytical, creative, focused, flexible, and committed to excellence. And I sketched a blueprint for the future. Now it's time to get to work.

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LITERATURE CITED

Acad. Psychol. Clin. Sci. 2005. http://www.psychclinicalscience.org

Am. Psychol. Assoc., Levant RF. 2005. *Report of the 2005 Presidential Task Force on Evidence-Based Practice*. http://www.apa.org/practice/ebpreport.pdf

Am. Psychol. Assoc. Office of Program Consultation and Accreditation. 2005. *Program consultation and accreditation*. http://www.apa.org/ed/accreditation

Am. Psychol. Assoc. Research Office. 2005. *Research office index*. http://research.apa.org/roindex.html

Am. Psychol. Assoc. Task Force on Workforce Analysis. 2004. *Final report*. Washington, DC: APA

Ashby FG, Maddox WT. 2005. Human category learning. *Annu. Rev. Psychol.* 56:149–78

Assoc. Psychol. Postdoc. Intern. Cent. 2005. *The APPIC match.* http://www.appic.org/match

Astin AW. 1961. The functional autonomy of psychotherapy. *Am. Psychol.* 16:75–78

Baker DB, Benjamin LT Jr. 2000. The affirmation of the scientist-practitioner: a look back at Boulder. *Am. Psychol.* 55:241–47

Benjamin LT Jr. 2005. A history of clinical psychology as a profession in America (and a glimpse at its future). *Annu. Rev. Clin. Psychol.* 1:1–30

Benjamin LT Jr, Baker DB, eds. 2000. Special section. History of Psychology. Boulder at 50: introduction to the section. *Am. Psychol.* 55:233–54

Bickman L. 1999. Practice makes perfect and other myths about mental health services. *Am. Psychol.* 54:965–78

Bigler ED. 2005. Role of clinical neuropsychology in the MRI age. *Clin. Neuropsychol.* 19:545 (Abstr.)

Chambless DL. 1995. Training in and dissemination of empirically-validated psychological treatments: report and recommendations. *Clin. Psychol.* 48:2–23

Chambless DL, Baker ML, Baucom DH, Beutler LE, Calhoun KS, et al. 1998. Update on empirically validated therapies, II. *Clin. Psychol.* 51:3–16

Chambless DL, Ollendick TH. 2001. Empirically supported psychological interventions: controversies and evidence. *Annu. Rev. Psychol.* 52:685–716

Chambless DL, Sanderson WC, Shoham V, Bennett Johnson S, Pope KS, et al. 1996. An update on empirically validated therapies. *Clin. Psychol.* 49:5–18

Cherry DK, Messenger LC, Jacoby AM. 2000. An examination of training model outcomes in clinical psychology programs. *Prof. Psychol. Res. Pract.* 31:562–68

Clay R. 1998. Mental health professions vie for position in the next decade. *APA Monitor* 29(10):20–21

Crits-Christoph P, Frank E, Chambless DL, Brody C, Karp JF. 1995. Training in empirically validated treatments: What are clinical psychology students learning? *Prof. Psychol. Res. Pract.* 26:514–22

Crits-Christoph P, Wilson GT, Hollon SD. 2005. Empirically supported psychotherapies: comment on Westen, Novotny, and Thompson-Brenner 2004. *Psychol. Bull.* 131:412–17

Crossman RE, Horowitz M, Morrison A. 2004. Intended consequences. *Am. Psychol.* 59:645–46

Cummings NA. 1995. Impact of managed care on employment and training: a primer for survival. *Prof. Psychol. Res. Pract.* 26:10–15

Cuthbert BN. 2006. Translational research and the future of psychological clinical science. See Treat et al. 2006. In press

Friedman TL. 2005. *The world Is Flat: A Brief History of the Twenty-First Century.* New York: Farrar, Straus and Giroux

Fyfe B. 1995. A field in transition. *APA Monitor* 26(11):5

Garb HN. 2005. Clinical judgment and decision making. *Annu. Rev. Clin. Psychol.* 1:67–89

Heiby EM, ed. 2002. Special issue: prescriptive authority. *J. Clin. Psychol.* 58:587–722

Heiby EM, DeLeon PH, Anderson T. 2004. A debate on prescription privileges for psychologists. *Prof. Psychol. Res. Pract.* 35:336–44

Jaffe DT. 2004. On the differences between academic research departments and professional schools. *Am. Psychol.* 59:647–48

Karon BP. 1995. Provision of psychotherapy under managed care: a growing crisis and national nightmare. *Prof. Psychol. Res. Pract.* 26:5–9

Kaslow NJ. 2004. Competencies in professional psychology. *Am. Psychol.* 59:774–81

Kenkel MB, DeLeon PH, Albino JEN, Porter N. 2003. Challenges to professional psychology education in the 21st century. *Am. Psychol.* 58:801–5

Klahr D, Simon HA. 1999. Studies of scientific discovery: complementary approaches and convergent findings. *Psychol. Bull.* 125:524–43

Korman M. 1974. National conference on levels and patterns of professional training in psychology: the major themes. *Am. Psychol.* 29:441–49

Lambert MJ, Hawkins EJ. 2004. Measuring outcome in professional practice: considerations in selecting and using brief outcome instruments. *Prof. Psychol. Res. Pract.* 35:492–99

Lang PJ, McTeague LM, Cuthbert BN. 2006. Fear, anxiety, depression, and the anxiety disorder spectrum: a psychophysiological analysis. See Treat et al. 2006. In press

Levant RF. 2004. The empirically-validated treatments movement: a practitioner perspective. *Clin. Psychol. Sci. Pract.* 11:219–24

Levant RF, Reed GM, Ragusea SA, DiCowden M, Murphy MJ, et al. 2001. Envisioning and accessing new roles for professional psychology. *Prof. Psychol. Res. Pract.* 32:79–87

Levenson RW. 2004. Mentoring: reflections on becoming an academic great-grandparent. *APS Observ.* 17(12):5/36

Maher BA. 1999. Changing trends in doctoral training programs in psychology: a comparative analysis of research-oriented versus professional-applied programs. *Psychol. Sci.* 10:475–81

McFall RM. 1991. Manifesto for a science of clinical psychology. *Clin. Psychol.* 44:75–88

McFall RM. 1996. Making psychology incorruptible. *Appl. Prev. Psychol.* 5:9–15

McFall RM. 2000. Elaborate reflections on a simple manifesto. *Appl. Prev. Psychol.* 9:5–21

McFall RM. 2006. On psychological clinical science. See Treat et al. 2006. In press

Moffitt T. 2005. The new look of behavioral genetics in developmental psychopathology: gene-environment interplay in antisocial behaviors. *Psychol. Bull.* 131:533–54

Moritz CH, Johnson SC, McMillan KM, Haughton VM, Meyerand ME. 2004. Functional MRI neuroanatomic correlates of the Hooper Visual Organization Test. *J. Int. Neuropsychol. Soc.* 10:939–47

Mukamel R, Gelbard H, Arieli A, Hasson U, Fried I, Malach R. 2005. Coupling between neuronal firing, field potentials, and fMRI in human auditory cortex. *Science* 309:951–54

Natl. Counc. Schools Programs Prof. Psychol. 2005. http://www.ncspp.info

Natl. Inst. Mental Health. 2000. *Translating behavioral science into action: report of the National Advisory Mental Health Council Advisory Workgroup.* http://www.nimh.nih.gov/publicat/nimhtranslating.pdf

Norcross JC, Castle PH, Sayette MA, Mayne TJ. 2004a. The PsyD: heterogeneity in practitioner training. *Prof. Psychol. Res. Pract.* 35:412–19

Norcross JC, Sayette MA, Mayne TJ. 2004b. *Insider's Guide to Graduate Programs in Clinical and Counseling Psychology.* New York: Guilford

Perrott LA. 1998. When will it be coming to the large discount chain store? Psychotherapy as a commodity. *Prof. Psychol. Res. Pract.* 29:168–73

Peterson DR. 1996. Making psychology indispensable. *Appl. Prev. Psychol.* 5:1–8

Peterson DR. 2003. Unintended consequences: ventures and misadventures in the education of professional psychologists. *Am. Psychol.* 58:791–800

Peterson RL, Peterson DR, Abrams JC, Stricker G. 1997. The National Council of Schools and Programs of Professional Psychology educational model. *Prof. Psychol. Res. Pract.* 28:373–86

Peterson RL, Trierweiler SJ. 1999. Scholarship in psychology: the advantages of an expanded vision. *Am. Psychol.* 54:350–55

Phillips KM, Brandon TH. 2004. Do psychologists adhere to the clinical practice guidelines for tobacco cessation? A survey of practitioners. *Prof. Psychol. Res. Pract.* 35:281–85

Pion GM. 1991. A national human resources agenda for psychology: the need for a broader perspective. *Prof. Psychol. Res. Pract.* 22:449–55

Pion GM, Kohout J, Wicherski M. 2000. "Rightsizing" the workforce through training reductions: a good idea? *Prof. Psychol. Res. Pract.* 31:266–71

Rae DW. 2003. *City: Urbanism and Its End*. New Haven, CT: Yale Univ. Press

Reed GM, Levant RF, Stout CE, Murphy MJ, Phelps R. 2001. Psychology in the current mental health marketplace. *Prof. Psychol. Res. Pract*. 32:65–70

Robiner WN. 1991. How many psychologists are needed? A call for a national psychology human resource agenda. *Prof. Psychol. Res. Pract*. 22:427–40

Robiner WN, Bearman DL, Berman M, Grove WM, Colón E, et al. 2002. Prescriptive authority for psychologists: a looming health hazard? *Clin. Psychol. Sci. Pract*. 9:231–48

Robiner WN, Bearman DL, Berman M, Grove WM, Colón E, et al. 2003. Prescriptive authority for psychologists: despite deficits in education and knowledge? *J. Clin. Psychol. Med. Settings* 10:211–21

Robiner WN, Crew DP. 2000. Rightsizing the workforce of psychologists in health care: trends from licensing boards, training programs, and managed care. *Prof. Psychol. Res. Pract*. 31:245–63

Rotter JB. 1971. On the evaluation of methods of intervening in other people's lives. *Clin. Psychol*. 24:1–2

Rupert PA, Baird KA. 2004. Managed care and the independent practice of psychology. *Prof. Psychol. Res. Pract*. 35:185–93

Schilling K, Packard R. 2005. *The 2005 Inter-Organizational Summit on Structure of the Accrediting Body for Professional Psychology. Final proposal*. http://www.psyaccreditationsummit.org

Schneider SF. 1991. No fluoride in our future. *Prof. Psychol. Res. Pract*. 22:456–60

Sechrest L. 1992. The past future of clinical psychology: a reflection on Woodworth 1937. *J. Consult. Clin. Psychol*. 60:18–23

Seligman MEP, Levant RF. 1998. News from Washington, DC: Managed care policies rely on inadequate science. *Prof. Psychol. Res. Pract*. 29:211–12

Sleek S. 1994. Layoffs proposed by VA show public sector needs protection. *APA Monitor* 25(5):34

Steinmetz JE. 2006. Using a simple associative learning procedure to study clinical disorders and related brain function. See Treat et al. 2006. In press

Stricker G, Trierweiler SJ. 1995. The local clinical scientist: a bridge between science and practice. *Am. Psychol*. 50:995–1002

Toga AW, Thompson PM. 2005. Genetics of brain structure and intelligence. *Annu. Rev. Neurosci*. 28:1–28

Treat TA, Bootzin RR, Baker TB. 2006. *Psychological Clinical Science: Papers in Honor of Richard M. McFall*. Mahwah, NJ: Erlbaum. In press

Treat TA, Dirks MA. 2006. Bridging clinical and cognitive science. See Treat et al. 2006. In press

VandenBos GR, DeLeon PH, Belar CD. 1991. How many psychological practitioners are needed? It's too early to know! *Prof. Psychol. Res. Pract*. 22:441–48

Weisz JR, Weersing VR, Henggeler SW. 2005. Jousting with straw men: comment on Westen, Novotny, and Thompson-Brenner 2004. *Psychol. Bull*. 131:418–26

Westen D, Novotny CM, Thompson-Brenner H. 2004. The empirical status of empirically supported psychotherapies: assumptions, findings, and reporting in controlled clinical trials. *Psychol. Bull*. 130:631–63

Westen D, Novotny CM, Thompson-Brenner H. 2005. EBP $\neq$ EST: reply to Crits-Christoph et al. 2005 and Weisz et al. 2005. *Psychol. Bull*. 131:427–33

Woodworth RS. 1937. The future of clinical psychology. *J. Consult. Psychol*. 1:4–5. Reprinted 1992 *J. Consult. Clin. Psychol*. 60:16–17

Yu LM, Rinaldi SA, Templer DI, Colbert LA, Siscoe K, Van Patten K. 1997. Score on the Examination for Professional Practice in Psychology as a function of attributes of clinical psychology graduate training programs. *Psychol. Sci*. 8:347–50