CHAPTER 3 Training Models in Professional Psychology Doctoral Programs

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Abstract

Since 1949, training models have defined doctoral training in professional psychology, serving to provide an identity for the field of professional psychology. This chapter reviews the development, central features (namely, emphases on science and practice), and implementation and evaluation of the scientist-practitioner model, scholar-practitioner model, and clinical-scientist models. The scientist-practitioner model is discussed as it integrates science and practice. The features of applied scholarship, practice, and science in the practitioner-scholar model are described, whereas the emphasis on evidence-based practice and training in scientific clinical psychology are characteristic of the clinical-scientist model. Training models provide an identity for graduate programs, but in some ways they have fractured the field of psychology with divisions by model. We suggest that professional psychology can continue to benefit from the advantages of models, but must also move beyond models as the primary basis for defining identity. We recommend that the profession work diligently toward integration to define itself to the public and address the profession's challenges, while remaining focused on training science-based, competent professional psychologists.

Key Words training models, scientist-practitioner, Boulder model, practitioner-scholar, scholar-practitioner, Vail model, clinical scientist, clinical-science model

Foundations for formal training models date back to the late 1800s when the profession of psychology—applying the science of psychology to assessment and interventions to improve individuals' lives—began to emerge (see Cautin & Baker, chapter 2, this volume, for a detailed review). Interestingly, the profession was defined first by the practice of clinical psychology and only later by training. In the last 100+ years, several training models have been developed to guide standards and practice of doctoral-level education in professional psychology. This chapter briefly describes the three predominant models in doctoral education —*scientist-practitioner, practitioner-scholar,* and *clinical-scientist models*; discusses the contributions and limitations of training models to professional psychology; and offers recommendations for maximizing training models' contributions to advancing the science and practice of professional psychology. To set the stage for the aforementioned discussions, a brief overview of the historical context in which training standards emerged is provided.

Historical Context

The profession of psychology existed for approximately 50 years before its training was formally articulated and systematized. Witmer, generally credited with founding clinical psychology, began the first psychology clinic in 1896. Over the next several years a handful of other psychology clinics opened across the country (Edelstein & Brastead, 1983; McReynolds, 1996). The year after Witmer opened his clinic, he began to offer a summer course in The Psychological Clinic at the University of Pennsylvania. However, it is not clear what, if any, training specific to clinical psychology was offered at other institutions (Routh, 2000). Over the next 50 years, eight institutions began to figure prominently in training individuals who became active in the profession of clinical psychology. However, this was no guarantee that the institutions offered a clinical psychology program. Rather, it is the graduates of these programs (e.g., Shakow, Raimy) who were instrumental in developing the first training standards for professional psychology (Routh, 2000). Similarly, although the first clinical internship began in 1908, the role of internship training as a formal part of doctoral education was not at all secure—few graduate programs required internship as part of the degree, and the largely unpaid internships tended to be a luxury that many students could not afford (Rogers, 1939).

The end of World War II in 1945 crystallized the need for training standards. With thousands of war veterans in need of psychological services, the demand for clinical psychologists clearly outstripped supply. To meet this demand, the Veteran's Administration (VA) and United States Public Health Service (and later the National Institute of Mental Health) asked the American Psychological Association (APA) to identify the training necessary for clinical psychologists and to provide a list of universities that offered such training (Donn, Routh, & Lunt, 2000). Thus, the APA established the Committee on Training in Clinical Psychology, headed by Shakow. The resulting report (titled "Recommended Graduate Training Program in Clinical Psychology," often dubbed "the Shakow Report"; APA Committee on Training in Clinical Psychology, 1947) described a recommended program of training in clinical psychology and served as the basis for evaluating training programs that later evolved into the profession's accreditation system. The report included many elements of present day professional psychology training, such as coursework in the science of psychology and professional application, and applied experiences through fieldwork and internship. Importantly, the report called for training in both research and practice, and suggested that well-balanced clinical psychologists would contribute to advancement of psychology through both activities (Edelstein & Brastead, 1983). The Shakow report laid the groundwork for the scientist-practitioner model that would emerge from the Boulder Conference a few years later. The report also considered suggestions to separate a professional degree for clinical psychologists from the research-oriented PhD, but rejected them in favor of the more integrative science-practice degree (Donn et al., 2000).

Scientist-Practitioner Model

Development: Boulder and Gainesville Conferences

In 1949, 73 representatives of professional psychology gathered in Boulder, Colorado for a 2-week Conference on Graduate Education in Clinical Psychology (the "Boulder Conference"; Benjamin & Baker, 2000). This conference was tasked with examining the then current models of training in clinical psychology and the national needs for psychological services, and recommending a model for providing graduate education in clinical psychology that would allow standardization across the profession. The agenda was wide-ranging, including discussions of curriculum (e.g., in the science of psychology, professional practice topics, ethics), research training, applied training, sequence of training (e.g., undergraduate access to clinical courses, master's training, postdoctoral training, internship timing), specialization, student selection and support, faculty training, societal needs, relationship to other professions, and the role of the federal government in training (Benjamin & Baker, 2000; Raimy, 1950). By the end of the Boulder Conference, approximately 70 resolutions were adopted that established the framework for training in professional psychology. Several of these resolutions become the foundation for all of professional psychology (e.g., inclusion of both research and applied training, foundations in broader field of psychology, ethics training, attention to student qualifications and faculty involvement) and are still in place today as part of accreditation and licensure standards (Commission on Accreditation—CoA, 2007; Association of State and Provincial Psychology Boards, 2008). The resolution that is most uniquely associated with the Boulder conference is the integration of science and practice. Thus, the terms *scientist-practitioner model* and *Boulder Model* often are used synonymously.

Following the Boulder conference, this training model was used by most graduate programs in clinical, as well as counseling and school, psychology, yet it was not formally articulated or endorsed by the broad training community. The 1990 Gainesville conference (Belar & Perry, 1992) was convened to do just that. Co-sponsored by major education, training, and credentialing organizations in North American professional psychology, conference attendees created and affirmed a document that outlined the basic principles and components of scientist-practitioner training. Major themes of the conference included reaffirmation of the scientist-practitioner model as necessary to meet the needs of the ever-changing discipline of psychology, the notion that science and practice are not points on a continuum nor parallel activities or skills, but are to be integrated within the diverse roles and activities in which professional psychologists engage, and explicit expansion of the model's applicability to all defined practice areas (clinical, counseling, school) as well as newly emerging areas.

Central Characteristics

Didactic and experiential training in research and practice. A central feature of the scientist-practitioner model that has become integral to all professional psychology training is training in both research and practice. From the outset, the Boulder conference attendees identified two basic societal needs to be addressed by clinical psychologists: professional services and research contributions. Raimy (1950) reported that "the Conference made an important decision when it recommended that research be given a place of equal and coordinate importance with practice in the education of graduate students…" (p. 23), noting that despite considerable discussion about whether all graduate students could be trained in

both areas, conference attendees agreed on the importance of research training in preparation of all professional psychologists. Two crucial points raised in the Boulder conference documents and echoed over the next 60 years support training in both research and practice for all professional psychologists (Raimy, 1950; Belar & Perry, 1992; Belar, 1998/2006; Jones & Mehr, 2007). The first point is that discovery of knowledge through systematic research and critical analysis of available data has traditionally been more distinctive of professional psychology than other professions. Thus, research contributions are an important and unique way in which professional psychology can meet societal needs. The second point is that research is not just the purview of academic psychologists in university settings, but is also a key role for psychologists in applied settings. In addition to needing sufficient research expertise to evaluate the evidence base for assessment and intervention procedures, psychologists in applied settings also often are called upon to conduct evaluation research and thus must be competent not just as consumers, but also producers of research.

As described in the scientist-practitioner model, training includes both didactic and experiential components to training in research and practice, with core faculty involved in both domains of training (Belar & Perry, 1992; Raimy, 1950). Specifically, training focuses on acquiring knowledge, skills, and attitudes (SKAs) (i.e., competence) related to scientific psychology; professional psychology (e.g., theories and scientific bases of assessment and intervention); evaluation of existing assessment and intervention methods/instruments and the designing new ones; critical thinking and hypothesis testing in both research and practice activities; designing, conducting, and interpreting research, including at least one predissertation project and the dissertation; and conceptualizing, assessing, and intervening with multiple problems and populations in multiple settings (Belar & Perry, 1992; Raimy, 1950). However, it is not so much the inclusion of both research and practice training, but their integration that is a hallmark of the science-practitioner model.

Science-practice integration. Although the importance of including both science and practice in professional psychology training is a point of general agreement across training models, the manner in which these two activities or skill sets coexist distinguishes training models from one another. The scientist-practitioner model emphasizes that *integration* of science and practice is critical to growth of the profession and meaningful contributions to society. Co-existence without integration (e.g., research and practice as two ends of a continuum of training emphasis or as parallel and separate activities) is not acceptable, because this model emphasizes that professional psychologists continually use both science and practice in mutually informing ways. The vision shared by proponents of the scientist-practitioner model is that integration leads to a product that is more than the sum of its parts—and thus leads to more meaningful advances in understanding human behavior and personality, assessing and intervening with maladaptive functioning, and promoting adaptive functioning, than either research or practice would alone (Belar, 2008; Jones & Mehr, 2007).

Implementation and Evaluation of the Model

Training the scientist-practitioner. Training the scientist-practitioner is not quite as simple as providing training in both research and practice; explicit and ongoing training in

integration is an essential component of this training model. Participants in the Gainesville conference agreed that many programs that identified as scientist-practitioner did not meet the ideal of fully integrated science-practice training (Belar & Perry, 1992). Several possible explanations for suboptimal science-practice integration have been offered, including potential personality differences between students who are interested in research versus practice, seemingly disparate skills involved in the critical and questioning nature of research versus the confidence in one's knowledge that facilitates clinical work, or the challenges to academicians in "publish or perish" environments of being effective science-practitioner role models (e.g., Frank, 1984; Mittelstaedt & Tasca, 1988). Given the challenges involved in integrative training, one contribution of the Gainesville conference report was the explicit description of multiple ways in which integration could or should be accomplished in didactic and practice activities. For example, conference proceedings emphasized that didactic science training should include skills needed to evaluate and develop clinical tools and should generate ideas that can be tested in both applied and research contexts. The conference report also asserted that practicum experiences should involve systematic application of knowledge from science to practice and systematic collection and communication of information) (Belar & Perry, 1992). These sorts of explicit suggestions might seem obvious, but it is clear from writings in the late 1980s and 1990s, and continuing today, that integrating science and practice is not as straightforward as it sounds.

Scientist-practitioner professional roles. Boulder-model advocates tend to agree that professionals may not engage in research and practice equally nor be equally competent in both domains, and that scientist-practitioners may hold many different jobs (e.g., Belar, 1998/2006; Horn et al., 2007). Scientist-practitioners may include researchers in academic or applied settings, practitioners in private or community settings, or individuals who engage in both research and practice activities. What characterizes all these individuals is that they approach their varied professional activities from an integrative perspective. Their practice is informed by research, including both the existing evidence base and their own ongoing research (e.g., case-specific hypothesis testing, program-evaluation research in their setting). Their research is informed by practice, including addressing personal and social factors that contribute to human adjustment and maladjustment, and evaluating assessment and intervention techniques in both controlled and natural practice settings. Dissemination is also a crucial part of science-practice integration. Although critics of the scientist-practitioner model have often pointed to low publication rates of practitioners as evidence of the model's limitations (e.g., Frank, 1984; see also Horn et al., 2007), traditional scientific publication is but one outcome of science-practice integration. In addition, scientist-practitioners may engage in many other methods of dissemination such as developing evidence-based and practically applicable treatment manuals, disseminating easily digestible scientific information to the lay public, or consulting with other health care professionals about how to apply psychological science knowledge to patient care.

Evaluation of the scientist-practitioner model. In the 60 years since its introduction, the scientist-practitioner model has had several critics, but many more supporters. Critics of the model have tended to argue that the original model emphasized research and practice as equally important but separate activities (e.g., Shapiro, 1967), that the original model intended

integration to reflect the application of scientific knowledge to practice versus requiring competence in actually doing research (e.g., Stricker & Trierweiler, 1995), or that the current notion of science-practice integration is not practical or feasible (e.g., Frank, 1984; Horn et al., 2007) and that training should focus on the activities students will engage in after graduation (Rothenberg & Matulef, 1969). As evidence, critics have cited surveys indicating that the majority of graduates of scientist-practitioner programs do not publish research after they graduate (Frank, 1984). However, advocates of the model cite multiple benefits of scientist-practitioner training beyond publication, such as the ability to scientifically evaluate client or program outcomes and to disseminate science-based knowledge and clinical services (e.g., Rickard & Clements, 1986).

Supporters of the scientist-practitioner model suggest that, even if ideal integration is still an aspirational goal for some programs, "the scientist-practitioner model with its interlocking skills in science and practice has been the source of growth for our clinical science and science-based practice" (Belar, 2008, p. 15) and that continued integration is critical to further advances in the profession. Supporters also suggest that this training model is ideal for those who wish to use scientific methods in professional practice (Belar, 1998/2006), an approach that is increasingly relevant as our profession, the health care community, and the public demand evidence-based services. Belar and others present evidence that the scientist-practitioner model does indeed "work" and that integration of science and practice may be better than it was 60 years ago. Unlike Shakow's era, in which graduate programs focused on course-work and research supervised by faculty with little applied involvement, the majority of clinical program faculty now are involved in applied work as part of their professional activity, and the majority of programs provide in-house practicum training supervised by core faculty (Belar, 1998/2006). Student surveys indicate that although many students plan to pursue clinical practice jobs, they consider research quite important, and most plan to adhere to a scientist-practitioner model and continue with some research involvement after graduation (Merlo, Collins, & Bernstein, 2008; Parker & Detterman, 1988).

Data also support the active role of both science and practice in Boulder-model training programs. For example, Cherry, Messenger, and Jacoby (2000) documented that scientist-practitioner-program students and faculty engage in more grant-supported research, publish more journal articles, and present more often at conferences than practitioner-scholar-model students (although they rank lower in grant supported research and journal authorships than clinical scientist program students and faculty). Further, scientist-practitioner students engage in comparable amounts of clinical service during training. Scientist-practitioner students also report that they spend substantial amounts of time engaged in research (37%), clinical service (29%), and integrative (17%) activities (Merlo et al., 2008). After graduation, scientist-practitioner students take jobs in a broad range of research and applied settings, and their weekly activities are characterized by an intermediate amount of research and applied involvement as compared to clinical-scientist and practitioner-scholar program graduates (Cherry et al., 2000). Scientist-practitioner-model students obtain internships at comparable rates (88–90%) and at generally comparable sites (e.g., VAs, medical centers, hospitals) as clinical-scientist students (Neimeyer, Rice, & Keilin., 2007; Sayette, Norcross, & Dimoff, 2011).

Practitioner-Scholar and Related Models

Development: Vail Conference

Alternatives to the scientist-practitioner model began to be formulated at the Vail (Colorado) Conference held in 1973. This conference resulted in the development of the PsyD degree and defined a philosophy for new doctoral training models that would focus primarily on professional practice training. The Vail Conference promoted an "ideological commitment to the tradition of empiricism and a clear affirmation of the fundamental importance of the scientific endeavor" (Korman, 1973, p. 19), while arguing for a predominant focus on preparing students for practice careers. Given the practice emphasis, ideal educators would be faculty and administrators who were actively pursuing professional practice in addition to their roles as educators (Korman, 1973). The Vail conference also emphasized flexibility in the location of training programs (e.g., in university departments or freestanding institutions) and a commitment to diversity among faculty and graduate students, as well as in opportunities for students to work with diverse clients and underserved populations. Interestingly, the Conference did not define a specific training model for the proposed PsyD degree (Korman, 1973). Instead, it paved the way for several related training models, including the practitioner-scholar, scholar-practitioner, practitioner, and local-clinical-scientist models. Although these training models share several core characteristics, they also vary somewhat in implementation emphasis.

Central Characteristics

Practice emphasis. Critics of the scientist-practitioner model argue that professional psychology graduates largely enter into practice careers and, thus, training should be geared toward these careers. Before establishment of the Vail model, proponents of practice-based education complained that professional training was insufficient to prepare students for practice careers, claiming that training delivered in university-based scientist-practitioner programs, may deprecate professional careers (Rothenberg & Matulef, 1969). Rothenberg and Matulef (1969) asserted that "the wrong people are training our professional oriented students!" (p. 33).

To address these issues, the Vail model aims to prepare students for "delivery of human services in a manner that is effective and responsive to individual needs, societal needs, and diversity" (McHolland, 1992, p. 159). A key feature of training is the comprehensive nature of clinical experiences, beginning early in graduate training. These models value diversity in clinical experiences obtained from a range of practica that are supported by formal coursework and supervised by professional role models. The Vail model also holds a broad view of clinical training that includes aspects of professional practice such as "administrative skills, program development and evaluation, and field research" (Korman, 1973, p. 103).

Role of science and research. In the Vail model, scientific training is provided in the context of clinical work and practica (Stoltenberg et al., 2000), and is tailored for the purpose of training students as consumers of research. However, participants in the Vail conference

agreed that training in program evaluation and effectiveness research was important for professional psychologists (Korman, 1973). Consequently, science training focuses on translating research and theory into practice, evaluating the utility of intervention research, and considering the effectiveness of their own clinical practice (Marwit, 1982). Practitioner-scholar programs vary in their commitment to research training, with some suggesting that a research emphasis detracts from professional training (Rothenberg & Matulef, 1969). Importantly, proponents of these models argue that conducting research is not essential for being a consumer of research. Thus, the Vail conference called for more diverse definitions of dissertations that support students' roles as professional psychologists. Dissertations may include empirical research studies, special projects, single-case study designs, and scholarly writings on psychological theory (Peterson, Peterson, Abrams, Stricker, & Ducheny, 2009).

Implementation and Evaluation of the Model

Practitioner-scholar, scholar-practitioner, and practitioner models. The terms *practitioner-scholar* and *scholar-practitioner* are often used interchangeably to refer to the same professional training model (we use the term *practitioner-scholar* to refer to all these model variants) in which students receive professional training with the goal of becoming practicing psychologists. These programs value a range of clinical endeavors as well as "theoretical analyses, methodological innovations, or any other intellectually disciplined enterprise" (Peterson, 1976, p. 793). Thus, training reflects these values, with clinical training aimed to produce practitioners and training in scholarly inquiry aimed to prepare students to apply psychological knowledge and theory. Of note, practitioner-scholar faculty members model professional identities as both scholars and practitioners; they publish scholarly works and continue their involvement in professional service delivery (Cherry et al., 2000), in addition to their roles as supervisors and educators.

Similar to the practitioner-scholar model in many ways, the practitioner model shares a commitment to the Vail tradition and to training practitioners, but differs in how it implements the Vail conference philosophy. The practitioner model centers almost solely on the identity of a practitioner. Scholarly work and scholarly inquiry is typically not a training goal beyond limited focus on the ways that science is relevant to practice. This model often is adopted in PsyD programs located at free-standing institutions where there is not the same emphasis on publishing research and scholarly works as in programs housed in more traditional university departments. As a result, faculty in practitioner programs serve as practitioner role models; they are most likely to engage in supervision and ongoing clinical work and typically do not publish (Peterson, 1985).

Local clinical-scientist model. This is the model embraced by the National Council of Schools and Programs of Professional Psychology (NCSPP). It represents an attempt to address the gap between science and practice for professional psychology students and involves training graduate students in the use of a particular critical-thinking process with which to conduct their professional work. The local clinical-scientist model might be thought of as a training philosophy that is overlaid on the practitioner-scholar or related training model, or a method of science-practice integration that is used with these training models. In

fact, most NCSPP programs that subscribe to the local clinical-scientist model actually define themselves as a combination of local clinical scientist and practitioner-scholar model programs.

Training in the local-clinical-scientist model is described as "strongly naturalistic, empiricist, hypothesis-focused, logical, and pragmatic" (Trierweiler, Stricker, & Peterson, 2010, p. 126). Its defining characteristics are a commitment to disciplined inquiry and consideration of local factors in both science and practice. Disciplined inquiry refers to a critical-thinking process that can be applied in both clinical work and scientific endeavors. This stems from the idea that "epistemology and critical thinking become more central to professional training" (Peterson et al., 2009, p. 21), such that students must be trained in a way to understand and think through the information presented to them once they leave graduate school. One significant feature of disciplined inquiry is the consideration of local contextual factors that contribute to a client's presenting problem (for a case example, see Peterson et al., 2009). The local clinical scientist must integrate information from the scientific literature, the individual client's characteristics, local influences, and other factors in case conceptualization (Peterson et al., 2009). Disciplined inquiry is also emphasized when it comes to evaluating, conducting, and synthesizing scientific research. For example, Peterson et al. (2009) describe a situation in which the local clinical scientist might use disciplined inquiry to develop a parent training group and evaluate the program. The local clinical scientist would consider the current literature on parent training as well as "of the necessary information, what is not available and therefore must be collected in a disciplined, though inexpensive, way? What are the relevant outcome variables, and how can relevant data be collected?" (p. 16). Trierweiler, Stricker, & Peterson (2010) describe the task of the local clinical scientist as "the ongoing, localized identification of important empirical phenomena and their interpretation in terms of relevant scientific hypotheses" (p. 126).

Students in local-clinical-scientist programs often do engage in scientific endeavors, but this is not a primary training emphasis. Importantly, there is a great deal of variability in participation in scientific work among students of these programs. Some NCSPP programs require doctoral dissertations in which some students elect to conduct empirical research for their projects, whereas others choose to engage in more applied scholarly work (Peterson et al., 2009). More specifically, as described by Peterson et al.:

> Types of dissertations may include the following: (a) theoretical analyses; (b) surveys; (c) analyses of archival data; (d) outcome research, including program development and evaluation; (e) systematic qualitative investigations; (f) public policy and legislative analysis; (g) case studies; and (h) group-based nomothetic investigations. (2009, p. 17).

Evaluation of the practitioner-scholar and variant models. Research on outcomes of these training programs has not made fine-grained distinctions among practitioner-scholar, scholar-practitioner, practitioner, or local-clinical-scientist programs, instead investigators often combine them or use institutional affiliation or research-practice emphasis as rough indicators of model. Most of this research supports a relative emphasis on practice versus research. For example, empirical evidences suggests that students in practitioner-scholar programs engage in predominantly professional service activities, spend only a small portion of their time on research, and have fewer professional presentations and publications than

students in scientist-practitioner or clinical-scientist programs. Interestingly however, these studies have demonstrated that practitioner-scholar students do not spend more time in service delivery training than students from more research-focused models (Cherry et al., 2000; Sayette et al., 2011). In contrast, practitioner-scholar graduates devote more time to professional service activity (approximately 60% of their week) than scientist-practitioner or clinical scientist graduates (Cherry et al., 2000). Practitioner-scholar and local clinical-scientist model graduates are often employed in a range of practice settings, such as medical centers and hospitals, private practice, community mental health centers, but also some academic settings (Cherry et al., 2000; Peterson et al., 2009). Several studies have indicated that students from practitioner-scholar and practice-focused programs obtain internships at lower rates than students from more research-focused or research-practice balanced programs (Neimeyer et al., 2007; Sayette et al., 2011). Likewise, graduates of practitioner-scholar and practice-focused programs score lower on the Examination for Professional Practice in Psychology (EPPP) licensing exam than their peers at equal emphasis or more research-oriented programs (Yu et al., 1997). Internship and job placements do reflect a strong practice focus, including a tendency for practitioner-scholar and practice-emphasis programs to be more likely than programs from other models to place their students at internships and jobs in university counseling centers, community mental health centers, and other contexts such as schools, family clinics, military internships, or forensics facilities (Cherry et al., 2000; Neimeyer, et al., 2007).

Clinical Scientist Model

Development: McFall Manifesto and Indiana and New York Conferences

The most recent alternative to the scientist-practitioner training model is the clinical-scientist model, which evolved from a series of papers and conferences in the early to mid-1990s. The critical pieces of what became the clinical-scientist model first were described in a paper dubbed the "McFall Manifesto" (McFall, 1991). In this paper, McFall proposed central principles to define the science of clinical psychology and discussed implications for clinical practice and training. His definition of psychological clinical science shared much with the ideals of the scientist-practitioner model. However, the specifics of the Manifesto resulted from what many clinical psychologists, particularly those with strong research orientations, saw as limitations in the way the scientist-practitioner model had evolved, as well as changing market conditions that supported cost-efficient service delivery by master's-level professionals. As such, McFall's paper made a strong call for greater emphasis on science and research in doctoral-level training and practice, and preparation for science-based careers.

Two conferences served to solidify the clinical-scientist model (McFall, 2006a. The first, Clinical Science in the 21st Century, was hosted in April, 1994 by Indiana University and aimed "to analyze the changing landscape in scientific clinical/health psychology and to chart a course for advancing the interests of clinical science" (Academy of Psychological Clinical Science, n.d.). Among issues discussed at the conference were the challenges to providing high

quality clinical scientist training and services especially in light of the demands of current accreditation and licensing requirements, limited funding for research and education, and the rapidly changing scope and knowledge base of scientific psychology. One outcome of the conference was establishment of the Academy of Psychological Clinical Science (APCS), through which like-minded training programs could work together to facilitate advances in clinical-scientist training. The second conference was the inaugural meeting of the APCS held in New York City in July, 1995. At this conference, representatives from APCS member programs drafted a mission statement that defined clinical science, and discussed clinical-science goals relevant to training, research, application, knowledge dissemination, and resources and opportunities to support these activities (APS, 2006). Unlike the Boulder and Vail conferences, the conferences that developed the clinical-scientist model did not result in a single published conference proceedings document. Instead, the central characteristics of the clinical-scientist training model can be gleaned from a combination of APCS materials found on the organization's website and the McFall Manifesto, which was endorsed as a supporting document.

Central Characteristics

Definition of clinical science. This model defines clinical science "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" (APCS, no date, "Mission," para. 1). The model's use of the term *clinical science* represents an attempt to address perceived weaknesses in prior training models, including deviations from the "scientific values that have served for a century as the keystone for doctoral training in all areas of psychology" (McFall, 2006a, p. 367).

Primacy of science in clinical psychology. The clinical-scientist model places scientific methods and evidence at the core and makes it very explicit that clinical psychology does not exist without science. The APCS mission statement underscores the importance of empirical approaches to all activities in which clinical psychologists engage, including development of scientifically valid assessment and intervention methods, application of these methods to address problems in human functioning, and dissemination of knowledge to consumers, health professionals, and policy makers (APCS, n.d.). Even more strongly, the McFall Manifesto states that "scientific clinical psychology is the only legitimate and acceptable form of clinical psychology" (p. 76) and challenges the profession to critically examine all its practices for scientific validity, to distinguish clearly between science and pseudoscience, and to "blow the whistle" on practices that fail to meet rigorous standards of scientific evidence (McFall, 1991). McFall further maintained that psychological services should not be administered, except under strict experimental control, without an explicit description of the exact nature of the service and of benefits that had been validated scientifically, as well as evidence that possible negative effects that might outweigh benefits had been ruled out empirically. This recommendation actually originated with Rotter (1971). However, McFall pointed out that the profession has been quite slow to adopt this level of quality assurance; although empirically

supported treatments exist for some problems, many clinical services continue to be offered without such support. He challenged the profession to cease delivery of unvalidated services and devote resources and expertise to the science that would expand the arsenal of empirically based procedures.

Training for clinical scientist research careers. McFall's Manifesto (1991) argued that doctoral training must have as its principle objective the production of the most competent clinical scientists possible. Similar to the scientist-practitioner model (e.g., Belar & Perry, 1992), McFall maintained that clinical scientist training would prepare graduates for a variety of careers in research, applied, or administrative settings. What is central to a clinical-scientist focus, however, is that, in each setting, clinical scientists are fundamentally scientists; their professional activities, both research and applied, contribute to advancement of scientific knowledge and methods. Again, although science-practitioner model supporters have repeatedly called for science-practice integration in training and professional activities and identity (e.g., Belar, 2008), McFall argued that the clinical-scientist model is much less ambiguous regarding this goal.

APCS's training goals seem to go further in specifying the desired career trajectories of clinical-scientist program graduates, stating that clinical scientist programs should "foster the training of students for careers in clinical science research, who skillfully will produce and apply scientific knowledge" (APCS, n.d.). Although successful implementation of clinical science includes application and dissemination (APCS goals 4 and 5; APCS, n.d.), involvement in research is the primary training goal. The focus on training clinical science researchers is further articulated in the eligibility criteria for a newly emerging accreditation system, the Psychological Clinical Science Accreditation System (PCSAS, 2011). This accreditation is limited to doctoral programs with a primary mission to train students "for successful careers as *research scientists in clinical psychology*" (PCSAS, 2011, "Eligibility Standards." para.3) and a primary goal to "produce graduates who are competent and successful at (a) conducting research relevant to the assessment, prevention, treatment, and understanding of health and mental health disorders, and (b) using science methods and evidence to design, develop, select, evaluate, implement, deliver, supervise, and disseminate empirically based assessments, interventions, and prevention strategies" ("Eligibility Standards." para.5).

Flexible, individualized, integrative training. As with other aspects of this model, the clinical-scientist model's recommendations regarding the structure of graduate training emerged out of perceived limitations in the training prescribed by the Boulder model. As McFall (2006b) notes, the recommended training that emerged in the mid-20th century was necessarily influenced by the scientific, technological, societal, and political realities of that era, and it would be surprising if much of the recommended training was not outdated. However, because many of these training recommendations have been solidified in accreditation and licensure requirements, they have been resistant to much change despite the profession's efforts (e.g., Schilling & Packard, 2005). In addition, despite the stated significance of science in psychology, the field generally does not have evidence to support its training methods or program components (Bickman, 1999; McFall, 2006b). Rather, training

often seems to be based on accreditation and licensure requirements and what has been done before, rather than a scientific database. Thus, in the context of current scientific knowledge and technology, societal needs, and market forces, and the absence of compelling evidence supporting the current structure and content of doctoral training, the clinical-scientist model advocates training that is scientific, integrative, individualized, and outcomes-oriented, but whose content is largely not prescribed. McFall (2006b) presented a blueprint for training in clinical scientist programs that outlines general principles and recommendations for training, and PCSAS further articulates what clinical scientist program accreditors look for in training programs.

McFall's (2006b) blueprint begins by articulating several guiding principles, including the view that scientific clinical psychology represents an applied science whose contributions and advancement depend on integration with other areas of psychology and other sciences, and the goal of doctoral training is to train research scientists rather than graduates whose primary function will be as mental health care providers. It then suggests that programs essentially start from scratch and design their curricula to meet their clinical scientist training goals and capitalize on the interests, expertise, and opportunities available to their faculty and students. With this approach, standardization of doctoral training would not be expected. However, evaluation data would clearly be essential to defining and refining high quality training. McFall's blueprint also lays out things that clinical scientist programs should avoid, including a vocational school-style focus on particular jobs and an overemphasis on practice training guided by accrual of hours or experiences rather than by the primary clinical-scientist mission to advance understanding and effective application of psychological science. Finally, the blueprint calls for a critical examination of doctoral training, identifying and evaluating differences among training models and programs so that we can better understand which differences matter and can develop a scientific knowledge base for training decisions.

PCSAS accreditation standards follow the general theme of the McFall blueprint, encouraging flexibility, individual tailoring, and innovative, integrated training that facilitates student competence in both research and practice. PCSAS materials (PCSAS, 2011) indicate that clinical science "is not restricted to one particular set of courses, training methods, or content areas, … [and] programs are encouraged to design curricula that promote integration, innovation, collaboration, and exploration across diverse areas of psychology and other sciences" (PCSAS, 2011, section D.2.b, Curriculum Design). Across the entire curriculum, programs are to provide evidence that supports their curriculum's effectiveness in producing competent and successful clinical-scientist graduates.

Implementation and Evaluation of the Model

The clinical-scientist model's place in professional psychology has yet to be defined fully. At present, it is restricted to programs in clinical psychology, but whether this is a function of its origin within clinical psychology or reflects some more fundamental philosophical distinctions between clinical and other areas of professional psychology remains to be seen. Full implementation of an individualized, innovative, and integrative clinical scientist curriculum as envisioned by McFall and others is still an aspirational goal for many programs.

This is likely due, at least in part, to the constraints of accreditation standards that require specific content and breadth of training, sometimes at the expense of depth in evidence-based graduate training (Davila & Hajcak, 2012). Whether curricula move closer to the clinical-scientist ideal, either within the existing APA-affiliated accreditation system or the emerging PCSAS system, remains to be seen. Perhaps more intractable are the constraints of licensing laws and statutes that in many states are very specific about curriculum requirements for license-eligibility (e.g., requiring specific coursework or specific credit hours). Given the slow speed with which state legislation often changes, tension between training program priorities and licensure requirements is likely to remain an issue for clinical scientist programs who wish to produce license-eligible graduates.

Empirical evaluations of the clinical-scientist model suggest that the model has some identifiable distinctions from other training models that are consistent with the model's philosophy and training goals. For example, Cherry et al. (2000) compared clinical scientist, scientist-practitioner, and practitioner-scholar programs and demonstrated that clinical scientist program students outpaced both their scientist-practitioner and practitioner-scholar program peers in their involvement in grant-supported research, journal publications, postgraduation employment in academic settings, and postgraduation involvement in basic and applied research. Clinical scientist program students did not differ in the amount of service delivery training during graduate school, but did engage in less service delivery after graduation. Similarly, Sayette et al. (2011) examined accredited PhD programs in clinical psychology, comparing APCS-member programs to university-based non-APCS programs and programs housed in specialized institutions (i.e., not offering comprehensive education beyond psychology or counseling). They identified similar differences in research emphasis and grant support, with APCS programs reporting more than other program types. Internship match, an important indicator of training program success, also supports the success of clinical scientist programs. Sayette et al. (2011) found that APCS programs and non-APCS university-based programs had comparable high rates of placing students in accredited or APPIC member internships (93% and 91%, respectively), and both had higher placement rates than specialized institution programs (61.5%). Similarly, Neimeyer et al. (2007) compared science-oriented, science-practice balanced, and practice-oriented programs (after demonstrating that these divisions were comparable to model-based divisions) and demonstrated that science-oriented and balanced programs had higher internship placement rates. They also found that science-oriented and balanced programs were more likely to place students in VA-hospital and medical-center internships, and less likely to place them in community-mental-health-center internships. Given the research-active nature of many VAs and medical centers (and indeed, the 10 APCS-member internships are all affiliated with VAs or medical centers), this suggests that clinical-scientist-model students are finding model-appropriate internships.

Applicability of Models in Professional Psychology

Across Program Type

The training models in professional psychology largely extend across the substantive

practice areas (e.g. clinical, counseling, and school). These models all emerged within clinical psychology, but as they have continued to develop, most have subsequently been adapted for training doctoral students in counseling and school psychology. This is mainly due to the commitment to training in both psychological science and practice at the doctoral level across defined practice areas in professional psychology.

The similarities between clinical and counseling psychology were noted at the Boulder Conference and the conferees believed that many aspects of training in clinical psychology could be translated to counseling psychology (Raimy, 1950). Subsequently, the Gainesville conference made the suitability of this training explicit (Belar & Perry, 1992). Counseling psychology has embraced the scientist-practitioner model (Cassin, Singer, Dobson, & Altmaier, 2007), but has been more hesitant in adopting other models (Stoltenberg et al., 2000). In fact, counseling psychology has an ongoing tradition of endorsing the scientist-practitioner model as central to the practice area at their training conferences (Meara et al., 1988; Fouad et al., 2004) and in published materials (e.g., Murdock, Alcorn, Heesacker, & Stoltenberg, 1998; Stoltenberg et al., 2000). Similar to clinical psychology, however, counseling psychology continues to debate the most effective way to train graduate students in integration of science and practice.

Because of the value of training in education and educational settings in school psychology, the Boulder Conference maintained that training in clinical psychology was not applicable to school psychology (and other related fields). However, similar to clinical and counseling psychology, the majority of school psychology doctoral programs are scientist-practitioner programs (Tharinger, Pryzwanksy, & Miller, 2008), with a few programs offering the more practice-focused PsyD degree. Across training models, school psychology training is characterized by additional competencies in education, learning, and children's school-based needs. For example, field work in most school-psychology programs, regardless of training model, typically involves working in a school or hospital setting. Thus, in school psychology, the scientist-practitioner and practitioner-scholar models are adapted for research and practice in educational and school settings. For example, the Blueprint III training model supported by the National Association for School Psychologists (NASP) maintains a commitment to both science and practice. In this model, two of the foundational competencies are "a well-confirmed knowledge base in psychology and education, and the application of the scientific method to practical delivery of the knowledge base" (Ysseldyke et al., 2006, p. 12), mirroring the scientist-practitioner model in many ways. Many doctoral programs in school psychology emphasize the use of empirically based interventions (Shernoff, Kratochwill, & Stoiber, 2003).

As noted earlier, the clinical-scientist model has only been adopted by clinical psychology graduate programs to date. Similar to the scientist-practitioner and practitioner-scholar models, this seems to reflect, at least in part, that the model originated within clinical psychology. In theory, this model could certainly be used by counseling and school psychology programs that are committed to empirical research and empirically based practice. However, given the strong allegiance to the scientist-practitioner model demonstrated by counseling and school-psychology programs, even after the practitioner-scholar model emerged as an

alternative(Neimeyer et al., 2007 Stoltenberg et al., 2000), it would not be surprising to see the clinical-scientist model grow slowly outside of clinical psychology.

Across Doctoral Degree Type

The PhD was established as the degree associated with the scientist-practitioner model at the Boulder Conference (Raimy, 1950) and more recently has also become the degree of the clinical-scientist model. In addition to establishing the PsyD degree, the Vail conference stipulated that professional training programs award the PsyD degree, whereas scientist and scientist-practitioner programs should award the PhD (Korman, 1973). Accordingly, most practitioner-scholar, scholar-practitioner, and practitioner programs grant the PsyD degree to graduates. However, there are practitioner-scholar programs that grant the PhD degree and scientist-practitioner that grant the PsyD degree. This often generates much confusion about the distinctions between the two degrees and the accompanying training models.

Confusion about degree and training model distinctions is complicated further by the many similarities shared by PhD and PsyD degree programs. Students of both degree programs receive some degree of research training, conduct clinical work, and complete a predoctoral internship. This is due, in part, to the fact that accreditation requirements apply to all professional psychology programs and are not specific to a particular degree. Programs granting both degrees also maintain a commitment to both science and practice in training students. Finally, research suggests that students of PhD and PsyD programs engage in equivalent amounts of professional-service delivery during their graduate training (Cherry et al., 2000).

The largest difference between PhD and PsyD programs lies in the amount of emphasis placed on science and practice, respectively. Typically, PhD programs place a greater emphasis on science-based education, with research-based dissertations and research assistantships, and more professional authorships, whereas PsyD programs emphasize practice-based education (Cherry et al., 2000). These relative training emphases in PhD and PsyD programs reflect students' career goals. In the survey by Cassin et al. (2007), PhD students indicated a greater interest in research and academic careers, whereas PsyD students reported a career focus on clinical work in clinics, hospital settings, or private practice.

For Master's Level Training

Historically, master's-level training has been omitted from consideration in professional psychology training. The Boulder conference maintained that the practicing degree in clinical psychology was the doctorate (Raimy, 1950). This was based on two important considerations: (1) who could claim the title "clinical psychologist" and (2) how much training was considered sufficient to develop the skills and knowledge necessary to effectively and safely conduct clinical practice. Importantly, the conferees determined that two years of master's training was insufficient to gain enough experience and skills to warrant the title of clinical psychologist. They noted a need for subdoctoral providers of professional services, but did not formulate plans for how to incorporate master's training into professional

psychology.

Master's level training has continued to be a subject of great debate in professional psychology due to increasing demands for psychological services and greater costs for services delivered by doctoral level psychologists. Supporters of professional master's training have raised two important issues: (1) that master's-level clinicians *do* engage in professional service delivery and (2) that doctoral students who fail to complete their programs are often granted master's degrees (Jones, 1979). These ideas were formally articulated at the Vail conference, which called for a deviation from the status quo by broadening professional psychology to include master's-level training (Korman, 1973). Several authors have proposed alternative conceptualizations of training at both the master's and doctoral level (e.g. Jones, 1979), and national organizations have evolved to address training standards and accreditation of master's in psychology programs (e.g., Council of Applied Master's Programs in Psychology; Masters in Psychology Accreditation Council). However, master's-levels training continues to remain largely outside the domain of professional psychology.

In addition to time required for degree completion, one major way in which master's- and doctoral-level training differs is the focus on science and practice. Whereas doctoral training frequently includes competence in both science and practice, master's programs typically emphasize either science or practice singularly. For example, many master's programs provide introductory training in psychological science or practice in preparation for attending a doctoral program in psychology. Students enrolled in research-based master's programs may become involved in faculty research, receive introductory training in statistical techniques, and complete an empirically based master's thesis. Alternatively, these programs may offer some field training, but this is often limited in scope and does not provide the training required by most states to become licensed following graduation. Thus, most students graduating from these programs often then apply to doctoral programs to continue their training.

There are also master's programs that provide practice degrees. These are mostly in fields outside of psychology (e.g. LPC, Ed.S.), but some states do grant licensure to master's level clinicians in psychology as well. These programs involve coursework and field work aimed to prepare students for clinical practice. These programs may incorporate scientific training into clinical training, but scientific training is not a major emphasis. Consistent with this practice emphasis, the practitioner-scholar models are most applicable to these master's programs.

For Internship Training

Although training models have been defined largely in the context of doctoral-program training, they are also relevant to the doctoral internship. First, as with doctoral programs, accredited internships must declare a training model that they use to guide their training (CoA, 2007). In contrast to doctoral programs, recent surveys of internships indicate that more than 50% self-identify as practitioner-scholar or related (e.g., practitioner, local clinical scientist) programs, with another 20% identifying as scientist-practitioner and fewer than 1% identifying as clinical-scientist programs (Rodolfa, Kaslow, Stewart, Keilin, & Baker, 2005). However, as Rodolfa et al. demonstrate, stated training model has questionable correspondence to the

training that internships actually provide; training models were not consistently related to differences in how programs conceptualized or implemented their training (Rodolfa et al., 2005). Similarly, Stedman and colleagues found that regardless of training model, most internships' training activities seem consistent with a practitioner or practitioner-scholar model, and that practice-based theoretical orientations (e.g., cognitive-behavioral, psychodynamic, systems) may better communicate what sort of training internships offer (Stedman, Hatch, Schoenfeld, & Keilin, 2005; Stedman, Hatch, & Schoenfeld, 2007). Based on these data, alternatives to the current training-model system have been suggested, including using practice-oriented theoretical models or competency domains to describe and evaluate internship training (e.g., Rodolfa et al., 2005; Stedman et al., 2007). However, it seems that theoretical models and competency domains are at least somewhat orthogonal to training models—it is possible to train various competencies, and to train assessment and intervention from various theoretical orientations, within scientist-practitioner, practitioner-scholar, or clinical-scientist perspectives. The fact that most internships do so from a self-identified practitioner-scholar perspective does not mean that others do not or could not train from another training-model perspective. Indeed, with the (albeit limited) growth of the pool of APCS-member clinical-scientist internships since Rodolfa et al. (2005) collected data in 2003, it seems that traditionally identified training models may yet have a role to play in internship training. Thus, as Rodolfa et al. (2005) suggest, it seems wise for the profession to further develop our understanding of how internships use training models, including their approach to science-practice integration, their theoretical orientation, and their focus on specific competencies, to guide training.

A second way in which training models might be relevant to internship is the extent to which a prospective intern's doctoral training model influences internship placement. Most research on internship placement has not examined the issue by program model, but instead by program or degree type (e.g., clinical, counseling, school; PhD vs. PsyD) or research emphasis. As is clear from preceding sections, program type and research emphasis serve as only rough markers for model, but may nevertheless yield some useful information. Several studies have examined internship placement for programs defined by research-practice emphasis (e.g., Neimeyer et al., 2007), program type (e.g., Keilin et al., 2007), or some combination of these factors (Norcross et al., 2010; Sayette et al., 2011), and have drawn similar conclusions. In general, PhD-granting programs and research-oriented or research-practice balanced programs place students in APA or CPA accredited and APPIC-member internships at higher rates than do PsyD-granting programs or practice-emphasis programs. In addition, of the handful of programs that Parent and Williamson (2010) identified as unequal contributors to the APPIC internship match (having large numbers of applicants to the match but extremely low placement rates), virtually all were PsyD and practice-oriented programs. Given that most internships seem to align with a practitioner-scholar or practitioner model, this evidence for advantage to intern applicants from more research-emphasis or equal-emphasis programs is interesting and suggests that factors other than program-model match may be at play.

Surveys of factors that internship programs consider crucial in selecting interns support the idea that doctoral-training model is just one element influencing internship placement. Rodolfa

et al. (1999) and later Ginkel, Davis, and Michael (2010) surveyed internship training directors about what they considered to the most influential factors in selecting interns. Across both studies, the factors considered most pertinent seemed to either reflect personal intern applicant characteristics (e.g., interview, professional demeanor) or to transcend training model (e.g., fit between applicant goals and internship opportunities, supervised clinical experience, coursework completion). Factors that may vary across training models, such as specific practice experiences or research productivity, fell into the lower or midrange portion of the importance rankings. However, it is essential to note that these data were collected from a broad range of internship directors; training model, via its implications for specific training experiences, may indeed influence the "fit" factor identified as most important.

Implications of Model for Doctoral Training: the Good, the Bad, and the Ugly

The Good: Contributions of Model to Quality Training

Almost since the inception of training in professional psychology, models have been an important part of programs' identity. Have they been helpful? In several respects, models do indeed seem to have made positive contributions to training. For example, by providing a framework of training goals and standards, models guide program development, implementation, and evaluation. Coursework, practicum experiences, and scientific endeavors are streamlined according to a basic program focus. Ideally, these experiences are tailored for the targeted outcomes of the program's training model. As described earlier, available data suggest that doctoral programs are generally successful at producing graduates who meet their training model's outcome goals, suggesting that programs are successfully preparing graduates for their intended career paths. Training models foster program evaluation by identifying the values, goals, and training outcomes that serve as the basic criteria for evaluation. For example, scientist-practitioner doctoral programs can evaluate whether they successfully integrate science and practice in their research and application training. Clinical scientist programs can evaluate the extent to which their graduates conduct research to advance the empirical base for intervention, whereas practitioner-scholar programs might focus on evaluating how successfully their graduates utilize the scientific literature to guide their practice.

Training models have also resulted in the grouping of like-minded programs (e.g. the development of APCS, NCSPP, and CUDCP: the Council of University Directors of Clinical Psychology). This is beneficial for several reasons. First, these like-minded programs serve as a training support group for each other. Second, members of these groups have historically made collaborative advances at conferences and other trainings. For example, with growing use among prospective students of the Internet for information about graduate programs, CUDCP passed a resolution to encourage all member programs to post "full disclosure" data on their websites, to inform the public about important program characteristics (e.g. statistics on applicant and admitted students, time to program completion, program costs, internship placements, licensure, attrition; Burgess, Keeley, & Blashfield, 2008). By 2006, a similar set

of information became required public disclosure for all accredited programs (IR C-20, initially adopted May, 2006; CoA, n.d.). These organizations also promote and encourage program evaluation through their culture of shared training goals and quality standards.

Finally, training models can facilitate communication with the public regarding a program's training philosophy, values, and training focus. For example, all accredited programs will share significant commonalities in training components, including curricular offerings and at least basic requirements for research and applied experiences. However, knowing a program's training model can help prospective students better understand the philosophy that the program will emphasize in training, the research or practicum training opportunities that will be available, and the careers for which graduates will be best prepared. Prospective students then have more accurate expectations of programs, which allows for more informed decision-making about what programs will best suit their interests and goals. In turn, when graduate programs receive applications from prospective students who are better fits for their program, this should contribute to a stronger graduate student body (for that program) and better program outcomes.

The Bad and Ugly: Limitations of Models for Quality Training

Despite the positive contributions of models to professional psychology training, they also come with limitations. For instance, it is not clear that training models as they have evolved are either necessary or sufficient to guide doctoral-level professional psychology training. Certainly, the profession has not considered a specific model to be necessary, instead taking a "thousand flowers" approach and encouraging diversity in professional psychology education (Benjamin, 2001). This creates an atmosphere in which models can guide training to meet different goals and needs, but can also spark continual and likely irreconcilable arguments about which model is best. As Belar notes, "discussions of educational philosophy are always value- and opinion-driven, as there is no clear scientific evidence to support one model of education and training over another in promoting public welfare" (Belar, 1998/2006, p. 77). To the extent that these arguments continue, they are much like "ethnic clashes" (Peterson, 2010, p. 59), occurring with no clear resolution and at the expense of profession-level advances.

Ironically, these arguments occur in the context of training that shares considerable overlap across identified training model. Repeatedly, the profession has identified principles that guide training regardless of model, such as grounding in the science of psychology including its content and methods; grounding in research, systematic, inquiry, and critical thinking; emphasis on delivery of effective services in a variety of settings and to a variety of consumers; and sensitivity to changes in science, technology, and the marketplace (e.g., Belar, 2008; Eby Chin, Rollock, Schwartz, & Worrell, 2011). However, the focus on differences versus commonalities has threatened to diminish the clear and unique identity of professional psychologists. In truth, psychologists are frequently seen as little different from other, and often less costly, mental health providers rather than professionals who are uniquely qualified to integrate research and practice in the development and delivery of effective health care (Belar, 2008; Bray, 2011; Eby et al., 2011).

Although models may be hotly debated in the training community, it is not clear that they are particularly meaningful outside academic training. The public does not know (or care) what training models exist; the treatment-seeking public wants to know that they can expect effective services and the degree-seeking public wants a meaningful and marketable education. As noted earlier, there is little correspondence between internships' stated models and their actual training activities or emphases, and doctoral programs from all model types demonstrate reasonable outcomes. In the authors' experiences, undergraduate students frequently do not know what the major training models are or what they imply for doctoral training. Rather, students want to know what activities they will participate in during graduate school and what careers they will prepare for. This may explain, in part, why studies of what factors students consider important in selecting graduate programs ask students about specific experiences like research and practicum opportunities, and general factors such as "fit with program," funding, or emotional climate (e.g., McIlvried, Wall, Kohout, Keys, & Goreczny, 2010; Walfish, Stenmark, Shealy, & Shealy, 1989). They do not ever ask students about training models.

Advancing Professional Psychology: Do Training Models Have a Role?

Given the ways in which training models both reflect and contribute to rifts within the field (Eby et al., 2011) as well as their questionable relevance outside it, do they have a role in promoting a stronger and more effective profession? We would argue that they do, for both philosophical and practical reasons. The challenge is to identify a role that is realistic, attainable, and that facilitates rather than stalls progress.

To begin to identify this role, it is useful to consider the alternative of abandoning training models as anachronisms that have outlived their usefulness. This is likely both unrealistic and ill-advised, for a few reasons. First, it is simply unlikely to work. Humans love to characterize, define, and categorize. If we jettison current training models, it is probable that something else would take their place. Second, as noted earlier, current training models do serve useful purposes—they provide a framework for designing, implementing, and evaluating training programs, as well as describing them in terms of some of the most important issues in the profession (e.g., science and practice identities; Eby et al., 2011). Alternatively, should we settle on a common training model that reflects the core identity and standards of professional psychology? Again, it is probably not realistic to think that the profession as a whole will be able to settle on one philosophical and values-based training model; the existing models exist because they have strong proponents and a large support base, and presumably because they offer something worthwhile. Although the profession is moving toward increased accountability, attempting to identify a "winning" model (from the existing models or a new one) through outcomes evaluation is also unlikely to work well, given disagreements about what the most important outcome variables are, what evidence is considered sufficient, and so on. As in the treatment-evaluation literature, evaluation of training models is likely to be best accomplished with questions such as "what works best under what conditions, for what purposes, and for whom?" The complexity of this question suggests that consistent with the profession's thousand-flowers approach, there is no one-size-fits-all training model.

An approach that is gaining increasing traction in the profession is to focus beyond training

models to the common values and issues in professional psychology. This involves bringing together individuals who represent diverse training models and interest groups in professional psychology for the purposes of wrestling with issues in the profession, identifying shared values, and pooling resources to address the issues and advance the profession. Examples of such collaborative efforts are seen in the formation and outcomes of the Council of Chairs of Training Councils (http://www.psychtrainingcouncils.org/), which has been instrumental in several tasks such as defining practicum, developing standards for evaluating students' practicum and professional competencies, and creating a toolkit for internship development. Another example of a collaborative effort is *Training and Education in Professional Psychology*, a journal devoted to the broad professional psychology training community, that is a product of the efforts of both the Association of Psychology Postdoctoral and Internship Centers (APPIC) and APA. These collaborative efforts are not simple, nor do they lead to quick solutions (e.g., see Eby et al.'s, 2011 description of their process of having authors from five different training councils collaborate on a paper on the future of professional psychology training), but they are an essential part of moving our profession forward so that it is less like "a thousand randomly blooming flowers, and more like the various sections of an orchestra, each with its own part to play in developing optimal psychological services to the public" (Eby et al., 2011, p. 66).

Having training models as harmonious sections of professional psychology's orchestra has potential benefits for the profession and the public. First, greater collaboration and cohesion across models may allow the profession to focus less on differences across models and more on presenting each model clearly. For example, CUDCP recently established a set of expectations for internship eligibility, to be shared with students and internship sites, based on goals of its scientist-practitioner and clinical scientist programs (CUDCP, 2011). Likewise, once the public understands who psychologists are as a whole and how they contribute uniquely to health care, it may be easier to describe model-based variations on the core identity in ways that matter to potential students, clients, and colleagues. Second, a culture of collaboration facilitates continued progress on critical issues in the profession. For instance, the current internship imbalance is affecting programs from all training models, and the solution will require involvement from all (Bieschke et al., 2011). In an era of increasing need for integrative, collaborative efforts across health care professions (Belar, 1998/2006), we must get better at collaborating within professional psychology.

Conclusions and Recommendations

Training models have a strong role in the development, implementation, and evaluation of doctoral-level professional psychology training. Although they are less clearly related to later stages of training (e.g., internship) and not always evident or meaningful to the public, training models have the potential to guide and inform these audiences as well. Our review indicates that the predominant training models—scientist-practitioner, practitioner-scholar, and clinical scientist—share several core values and principles, but also demonstrate important differences in how they envision and carry out education and training, most notably in the relative emphasis on research and practice in training focus and career goals. However,

differences often devolve into "model wars" (Bieschke et al., 2011) that can seriously interfere with the profession's advancement. Based on the contributions and limitations of training models to professional psychology, we offer several suggestions for maximizing their positive impact.

First, we recommend that the profession continue to look beyond training models and focus on integrative, collaborative efforts to clearly define our profession and address issues facing us. As several have suggested, no one but professional psychologists really understand or care about our training models; members of the public merely care about well-trained professionals and quality health care. In a nutshell, they want competent providers and evidence-based, effective care. Providing these as part of the larger system of health-related scientists and health care providers requires that we become integrated and harmonious parts of the orchestra. In particular, two points of integration—our profession's longstanding commitment to science-based practice (e.g., Belar, 1998/2006) and our increasing focus on competencies (see Fouad & Grus's chapter 3, this volume)—are perhaps the most significant ways in which this can be achieved.

Second, we suggest that in the context of an integrated, collaborative identity, training models can be used effectively to supplement and sharpen our identities as professional psychologists. As the identity of the orchestra is cemented, the distinctive roles and contributions of various sections can become clearer. However, training models should always be consistent with the core identity of professional psychology. Third, we recommend that programs and the profession make greater efforts to describe training models more transparently and explicitly to the public, focusing on what the models provide and how they matter. Finally, echoing recommendations from throughout the training community, we strongly recommend ongoing and careful evaluation of how training models impact professional psychology education and training, with particular attention to outcomes that are relevant to advancing our science and practice. It is these program- and profession-level evaluations that will guide further development of training models in professional psychology.

References

Academy of Psychological Clinical Science (APCS). (n.d.). Origins and backgrounds. Retrieved May 30, 2012 from http://acadpsychclinicalscience.org/index.php?page=origins.

American Psychological Association Committee on Training in Clinical Psychology. (1947). Recommended graduate training program in clinical psychology. *American Psychologist, 2*, 539–558. doi: 10.1037/h0058236

Association for Psychological Science (APS). (2006). A new alliance of doctoral training program forms. Retrieved May 30, 2012 from http://www.psychologicalscience.org/index.php/publications/observer/1996/january-96/a-new-alliance-of-doctoral-training-programs-forms.html.

Association of State and Provincial Psychology Boards (ASPPB). (2008). ASPPB's guide for students and faculty: Entry requirements for the professional practice of psychology. Retrieved June 1, 2012 from http://www.asppb.net/files/public/09_Entry_Requirements.pdf/

Belar, C. D. (2006). Graduate education in clinical psychology: "We're not in Kansas anymore." *Training and Education in Professional Psychology*, (Suppl.), 69–79. (Reprinted from *American Psychologist*, 1998, *53*, 456–464). doi: 10.1037/1931-3918.S.69

Belar, C. D. (2008). Changing education needs of psychologists: Do we need more medical knowledge, basic science and more psychological science? *Journal of Clinical Psychology in Medical Settings*, *15*, 12–17. doi: 10.1007/s10880-008-9097-8

Belar, C. D., & Perry, N. W. (1992). National Conference on Scientist-Practitioner Education and Training for the Professional Practice of Psychology. *American Psychologist, 47*, 71–75. doi: 10.1037/0003-066X.47.1.71

Benjamin, L. T. Jr., (2001). American psychology's struggle with its curriculum: Should a thousand flowers bloom? *American Psychologist, 56*, 735–742. doi: 10.1037/0003-066X.56.9.735

Benjamin, L. T. Jr., & Baker, D. B. (2000). Boulder at 50: Introduction to the section. *American Psychologist*, *55*, 233–236. doi: 10.1037/h0087859

Bickman, L. (1999). Practice makes perfect and other myths about mental health services. *American Psychologist, 54*, 965–978. doi: 10.1037/h0088206

Bieschke, K. J., Bell, D., Davis, C. III, Hatcher, R., Peterson, R., & Rodolfa, E. R. (2011). Forests, grazing areas, water supplies, and the internship imbalance problem: Redefining the paradigm to implement effective change. *Training and Education in Professional Psychology, 5*, 123–125. doi: 10.1037/a0024902

Bray, J. H. (2011). Training for the future of psychological practice. *Teaching and Education in Professional Psychology, 5*, 69–72. doi: 10.1037/a0023713

Burgess, D., Keeley, J., & Blashfield, R. (2008). Full disclosure data on clinical psychology doctorate programs. *Training and Education in Professional Psychology, 2*, 117–122. doi: 10.1037/1931-3918.2.2.117

Cassin, S. E., Singer, A. R., Dobson, K. S., & Altmaier, E. M. (2007). Professional interests and career aspirations of graduate students in professional psychology: An exploratory survey. *Training and Education in Professional Psychology, 1*, 26–37. doi: 10.1037/1937-3918.1.1.26

Cherry, D. K., Messenger, L. C., & Jacoby, A. M. (2000). An examination of training model outcomes in clinical psychology programs. *Professional Psychology: Research and Practice. 31*, 562–568. doi: 10.1037/0735-7028.31.5.562

Commission on Accreditation (CoA). (2007). Guidelines and principles for accreditation of programs in professional psychology. Washington, DC: American Psychological Association.

Council of University Directors of Clinical Psychology (CUDCP). (2011). Expectations for internship eligibility. Retrieved June 1, 2012 from http://www.cudcp.us/files/Reports/CUDCP%20Internship%20Expectations%20(2011).pdf

Davila, J., & Hajcak, G. (2012). From fractionism to integration: Problems and possible alternatives for clinical science training. *The Behavior Therapist*, *35*, 1–3.

Donn, J. E., Routh, D. K., & Lunt, I. (2000). From Leipzig to Luxembourg (via Boulder and

Vail): A history of clinical psychology training in Europe and the United States. *Professional Psychology: Research and Practice, 31*, 423–428. doi: 10.1037/0735-7028.31.4.423

Eby, M. D., Chin, J. L., Rollock, D., Schwartz, J. P., & Worrell, F. C. (2011). Professional psychology training in the era of a thousand flowers: Dilemmas and challenges for the future. *Training and Education in Professional Psychology, 5*, 57–68. doi: 10.1037/a0023462

Edelstein, B. A., & Brastead, W. S. (1983). Clinical training. In M. Hersen, A. Kazdin, & A. Bellack (Eds.), *The clinical psychology handbook* (pp. 35–56). New York: Pergamon Press.

Fouad, N. A., McPherson, R. H., Gerstein, L., Bluestin, D., L., Elman, N., Helledy, K.,I., Metz, A. J. (2004). Houston, 2001: Context and legacy. *The Counseling Psychologist, 32*, 15–77. doi: 10.1177/0011000003259943

Frank, G. (1984). The Boulder model: History, rationale, and critique. *Professional Psychology: Research and Practice, 15*, 417–435. doi: 10.1037/0735-7028.15.3.417

Ginkel, R. W., Davis, S. E., & Michael, P. G. (2010). An examination of inclusion and exclusion criteria in the predoctoral internship selection process. *Training and Education in Professional Psychology, 4*, 213–218. doi: 10.1037/a0019453

Horn, R. A., Troyer, J. A., Hall, E. J., Mellott, R. N., Cote, L. S., & Marquis, J. D. (2007). The scientist-practitioner model: A rose by any other name is still a rose. *American Behavioral Scientist, 50*, 808–819. doi: 10.1177/0002764206296459

Jones, A. C. (1979). A model of psychological practice for PhD and MA professionals. *Professional Psychology, 10*, 189–194.

Jones, J. L., & Mehr, S. L. (2007). Foundations and assumptions of the scientist-practitioner model. *American Behavioral Scientist, 50*, 766–771. doi: 10.1177/0002764206296454

Keilin, W. G., Baker, J., McCutcheon, S., & Peranson, E. (2007). A growing bottleneck: The internship supply-demand imbalance in 2007 and its impact on psychology training. *Training and Education in Professional Psychology, 1*, 229–237. doi: 10.1037/1931–3918.1.4.229

Korman, M. (Ed.) 1973. *Levels and patterns of professional training in psychology*. Washington, DC: American Psychological Association.

Marwit, S. J. (1982). In support of university-affiliated schools of professional psychology. *Professional Psychology, 13*(2), 181–190. doi: 10.1037/0735-7028.13.2.181

McFall, R. M. (1991). Manifesto for a science of clinical psychology. *The Clinical Psychologist, 44*, 75–88.

McFall, R. M. (2006a). On psychological clinical science. In T. A. Treat, R. R. Bootzin, & T. B. Baker (Eds.), *Psychological clinical science: Papers in honor of Richard M. McFall* (pp. 363–396). New York: Psychology Press.

McFall, R. M. (2006b). Doctoral training in clinical psychology. *Annual Review of Clinical Psychology, 2*, 21–49. doi: 10.1146. annurev.clinpsy.2.022305.095245

McHolland, J. D. (1992). National Council of Schools of Professional Psychology core curriculum conference resolutions. In R. L. Peterson, J. McHolland, R. J. Bent, E. Davis-

Russell, G. E. Edwall, K. Polite, D. L. Singer, & G. Stricker (Eds.), *The core curriculum in professional psychology* (pp. 155–166). Washington, DC: American Psychological Association. doi: 10.1037/10103-029

McIlvried, E. J., Wall, J. R., Kohout, J., Keys, S., & Goreczny, A. (2010). Graduate training in clinical psychology: Student perspectives on selecting a program. *Training and Education in Professional Psychology, 4*, 105–115. doi: 10.1037/a0016155

McReynolds, P. (1996). Lightner Witmer: A centennial tribute. *American Psychologist, 51*(3), 237–240. doi: 10.1037/0003-066X.51.3.237

Meara, N. M., Schmidt, L. D., Carrington, C. H., Davis, K. L., Dixon, D. N., Fretz, B. R., … Suinn, R.M. 1988). Training and accreditation in counseling psychology. *The Counseling Psychologist, 16*, 366–384. doi: 10.1177/00110000088163005

Merlo, L. J., Collins, A. B., & Bernstein, J. (2008). CUDCP-affiliated clinical psychology student views of their science training. *Training and Education in Professional Psychology, 2*, 58–65. doi: 10.1037/1931-3918.2.1.58

Mittelstaedt, W. T., & Tasca, G. (1988). Contradictions in clinical psychology training: A trainees' perspective of the Boulder model. *Professional Psychology: Research and Practice, 19*, 353–355. doi: 10.1037/0735-7028.19.3.353

Murdock, N. L., Alcorn, J., Heesacker, M., & Stoltenberg, C. (1998). Model training program in counseling psychology. *The Counseling Psychologist, 26*, 658–672. doi: 10.1177/0011000098264008

Neimeyer, G. J., Rice, K. G., & Keilin, W. G. (2007). Does the model matter? The relationship between science-practice emphasis in clinical psychology programs and the internship match. *Training and Education in Professional Psychology, 1*, 153–162. doi: 10.1037/1931-3918.1.3.153

Norcross, J. C., Ellis, J. L., & Sayette, M. A. (2010). Getting in and getting money: A comparative analysis of admission standards, acceptance rates, and financial assistance across the research–practice continuum in clinical psychology programs. *Training and Education in Professional Psychology, 4*, 99–104. doi: 10.1037/a0014880

Parent, M. C., & Williamson, J. B. (2010). Program disparities in unmatched internship applicants. *Teaching and Education in Professional Psychology, 4*, 116–120. doi: 10.1037/a0018216

Parker, L. E., & Detterman, D. K. (1988). The balance between clinical and research interests among Boulder model graduate students. *Professional Psychology: Research and Practice, 19*, 342–344. doi: 10.1037/0735-7028.19.3.342

Peterson, D. R. (1976). Need for the doctor of psychology degree in professional psychology. *American Psychologist, 31*, 792–798. doi: 10.1037/0003-066X.31.11.792

Peterson, D. R. (1985). Twenty years of practitioner training in psychology. *American Psychologist, 40*, 441–451. doi: 10.1037/0003-066X.40.4.441

Peterson, R. L. (2010). Threats to quality in professional education and training: The politics of models, obfuscation of the clinical, and corporatization. In M. B. Kenkel and R. L. Peterson (Eds.), *Competency-based education for professional psychology* (pp. 55–65). Washington, DC: American Psychological Association. doi: 10.1037/12068-003

Peterson, R. R., Peterson, D. L., Abrams, J., Stricker, G., & Ducheny, K. (2009). The National Council of Schools and Programs of Professional Psychology education model 2009. In M. B. Kenkel & R. L. Peterson (Eds.), *Competency-based education for professional psychology* (pp. 13–42). Washington, DC: American Psychological Association.

Psychological Clinical Science Accreditation System (2011). Accreditation review standards and criteria. Retrieved June 1, 2012 from http://www.pcsas.org/review.php.

Raimy, V. C. (Ed.). (1950). *Training in clinical psychology*. New York: Prentice Hall.

Rickard, H. C., & Clements, C. B. (1986). Compared to what? A frank discussion of the Boulder model. *Professional Psychology: Research and Practice, 17,* 472–473.

Rodolfa, E. R., Kaslow, N. J., Stewart, A. E., Keilin, W. G., & Baker, J. (2005). Internship training: Do models really matter? *Professional Psychology: Research and Practice, 36,* 25–31. doi: 10.1037/0735-7028.36.1.25

Rodolfa, E. R., Vieille, R., Russell, P., Nijjer, S., Nguyen, D. Q., Mendoza, M., & Perrin, L. (1999). Internship selection: Inclusion and exclusion criteria. *Professional Psychology: Research and Practice, 30,* 415–419. doi: 10.1037/0735-7028.30.4.415

Rogers, C. R. (1939). Needed emphases in the training of clinical psychologists. *Journal of Consulting Psychology, 2,* 1–6. doi: 10.1037/h0056807

Rothenberg, P. J., & Matulef, N. J. (1969). Toward professional training: A special report from the National Council on Graduate Education in Psychology. *Professional Psychology, 1,* 32–37. doi: 10.1037/h0028677

Rotter, J. B. (1971). On the evaluation of methods of intervening in other people's lives. *Clinical Psychology, 24,* 1–2.

Routh, D. K. (2000). Clinical psychology training: A history of ideas and practices prior to 1946. *American Psychologist, 55*(2), 236–241. doi: 10.1037/0003-066X.55.2.236

Sayette, M. A., Norcross, J., & Dimoff, J. D. (2011). The heterogeneity of clinical psychology Ph.D. programs and the distinctiveness of APCS programs. *Clinical Psychology: Science and Practice, 18,* 4–11. doi: 10.1111.j.1468-2850.2010.01227.x

Schilling, K., & Packard, R. (2005). The 2005 Inter-Organizational Summit on Structure of the Accrediting Body for Professional Psychology: Final proposal. Retrieved May 30, 2012 from http://www.psyaccreditationsummit.org.

Shapiro, M. B. (1967). Clinical psychology as an applied science. *British Journal of Psychiatry, 113,* 1039–1042. doi:10.1192. bjp.113.502.1039

Shernoff, E. S., Kratochwill, T. R., & Stoiber, K. C. (2003). Training in evidence-based interventions (EBIs): What are school psychology programs teaching? *Journal of School Psychology, 41,* 467–483. doi: 10.1016/j.jsp.2003.07.002

Stedman, J. M., Hatch, J. P., & Schoenfeld, L. S. (2007). Toward practice-oriented theoretical models for internship training. *Training and Education in Professional Psychology, 1,* 89–94. doi: 10.1037/1931-3918.1.2.89

Stedman, J. M., Hatch, J. P., Schoenfeld, L. S., & Keilin, W. G. (2005). The structure of internship training: Current patterns and implications for the future of clinical and counseling psychologists. *Professional Psychology: Research and Practice, 36,* 3–8. doi: 10.1037/0735-7028.36.1.3

Stoltenberg, C. D., Pace, T. M., Kashubeck-West, S., Biever, J. L., Patterson, T., & Welch, D. I. (2000). Training models in counseling psychology: Scientist practitioner versus practitioner-scholar. *The Counseling Psychologist*, *28*, 622–640. doi: 10.1177/0011000000285002

Stricker, G., & Trierweiler, S. J. (1995). The local clinical scientist: A bridge between science and practice. *American Psychologist*, *50*, 995–1002. doi: 10.1037/0003-066X.50. 12.995

Tharinger, D. J., Pryzwanksy, W. B., & Miller, J. A. (2008). School psychology: A specialty of professional psychology with distinct competencies and complexities. *Professional Psychology: Research and Practice, 39,* 529–536. doi: 10.1037/0735-7028.39.5.529

Trierweiler, S. J., Stricker, G. & Peterson, R. L. (2010). The research and evaluation competency: The local clinical scientist-review, current status, future directions. In M. Kenkel & R. L. Peterson (Eds.), *Competency-based education for professional psychology* (pp. 125–141). Washington, DC: American Psychological Association.

Walfish, S., Stenmark, D. E., Shealy, S., & Shealy, S. (1989). Reasons why applicants select clinical psychology graduate programs. *Professional Psychology: Research and Practice*, *20*, 350–354. doi: 10.1037/0735-7028.20.5.350

Ysseldyke, J., Morrison, D., Burns, M., Ortiz, S., Dawson, P., Rosenfield, S., … Telzrow, C. (2006). *School psychology: A blueprint for training and practice III*. Bethesda, MD: National Association for School Psychologists.

Yu, L. M., Rinaldi, S. A., Templer, D. I., Colbert, L. A., Siscoe, K., & Van Patten, K. (1997). Score on the Examination for Professional Practice in Psychology as a function of attributes of clinical psychology graduate programs. *Psychological Science*, *8*, 347–350. doi: 10.1111/j.1467-9280.1997. tb00423.x