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Article · January 2010

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THE RESEARCH AND EVALUATION COMPETENCY: THE LOCAL CLINICAL SCIENTIST—REVIEW, CURRENT STATUS, FUTURE DIRECTIONS

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The *local clinical scientist* originally was framed as a model for training professional psychologists in the research and evaluation competency (Trierweiler & Stricker, 1992). In contrast to the vagueness of the traditional scientist–practitioner training model for clinical psychology (Raimy, 1950), the local clinical scientist model identified how a clinician psychologist is supposed to be scientific in actual practice by drawing attention to the scientific issues intrinsic to a locally specific domain of inquiry. In addition to training in standard academic science and methodology, research training was seen to involve complex identity, attitude, knowledge, and critical thinking issues. A realistic portrayal of the phenomena that clinical practitioners actually confront in their daily activities suggests that practice is more than simply applied science. Local clinical inquiry is scientific inquiry: The task of the local clinical scientist is constantly to seek linkages between psychological science and the empirical realities of practice and to identify phenomena

within the practice setting that are central to the intervention and are potentially in need of scientific clarification (Trierweiler & Stricker, 1998; Trierweiler, 2006; see also D. R. Peterson & Peterson, 1997). In this sense, the local clinical scientist model provides a bridge between science and practice that had not previously been explicated (Stricker & Trierweiler, 1995; cf. Shakow, 1976; Kanfer, 1990; D. R. Peterson, 1991). But even more, in keeping with the helping goal that is intrinsic to the professional practice, the local clinical scientist model demands that the empirical truths of particular cases in particular clinical settings provide the ultimate criteria for the success of professional inquiry (Trierweiler, 2006; Trierweiler & Stricker, 1998). The action component of the local clinical scientist model is not statistical. Rather, it involves the ongoing, localized identification of important empirical phenomena and their interpretation in terms of relevant scientific hypotheses. Accordingly, training in the model is strongly naturalistic, empiricist, hypothesis-focused, logical, and pragmatic.

This chapter discusses the research and evaluation competency. In 2007, the National Council of Schools and Programs of Professional Psychology (NCSPP) created developmental achievement levels (DALs) for each core competency. Table 7.1 describes the domains of the research and evaluation competency and the knowledge, skills, and attitudes needed for each domain at the prepracticum, preinternship, and degree completion levels.

This chapter focuses on the local clinical scientist and related training models for the research and evaluation competency and discusses some of the issues raised by this conceptualization. In particular, we focus on the ways the model has been misunderstood by contrasting it with its alternatives, highlighting some of the promising ways it has been implemented, and discussing the extensive work still needed to realize its potential.

SCIENTIFIC TRAINING FOR THE PROFESSIONAL PSYCHOLOGIST

Over the years, the most serious controversies and misunderstandings surrounding the NCSPP model have concerned the role of science in the education of professional psychologists (e.g., Bieshke, Fouad, Collins, & Halonen, 2004; Dawes, 1994; Hays, 1986; Hoshmand & Polkinghorne, 1992; McFall, 1991, 1996; Messer, 2004; D. R. Peterson, 1985, 1991, 1996a, 1996b; Stricker, 1992; Trierweiler, 1987, 2006; Trierweiler & Stricker, 1998). Allegations to the contrary notwithstanding (e.g., McFall, 1991, 1996), no one has ever questioned the notion that all professional psychologists, whether PhD or PsyD, are to be scientifically educated and trained in all aspects of their education, not just when they are conducting research or evaluation. However, adopting a metaperspective on scientific training, NCSPP has made it clear that a scientific training model must be compatible with the realities

TABLE 7.1
Knowledge, Skills, and Attitudes and Domains for the Research and Evaluation Competency

	Begin practicum	Begin internship	Complete doctoral degree
Critical evaluation of research domain			
K	1. Familiarity with different research methodologies (e.g., qualitative, quantitative) 2. Foundation knowledge of psychometric theory underlying frequently used measures (e.g., reliability, validity) 3. Understanding of important link between critical thinking and clinical decisions	1. Understanding of the strengths and limitations of different research methodologies (i.e., quantitative and qualitative; efficacy and effectiveness) and sources of information 2. Understanding of advanced statistical procedures as they are found in the psychological literature 3. Understanding of the process of psychometric research	1. Understanding of different epistemologies, including an understanding of western science in its cultural context 2. Maintenance and expansion of breadth and depth of knowledge statistics and research design
S	1. Ability to read research articles and critically evaluate truth claims at an introductory level 2. Grasp of basic library search techniques and ability to locate appropriate sources of information	1. Ability to critically evaluate literature (discriminate solid and relevant articles from others) and apply to clinical work 2. Grasp of advanced library search techniques 3. Ability to independently conduct a comprehensive literature review on a topic of interest	1. Ability to critically evaluate research literature in terms of applicability to specific clinical questions 2. Ability to smoothly explain relevant professional research literature to a client 3. Ability to critically evaluate different epistemologies
A	1. Ability to distinguish scientific evidence from personal opinion	1. Recognition of the value of staying current in the literature 2. Maintenance of an attitude of healthy skepticism 3. Openness to multiple ways of knowing	1. Incorporation of scientific attitudes and values in work as a psychologist
Conducting and using research in applied settings domain			
K	1. Knowledge of basic statistical concepts 2. Beginning understanding of how personal biases can limit inquiry and research	1. Recognition of own limitations in research 2. Understanding of the importance and value of consultation	1. Understanding of how to build new practice methods and adjust interventions based on evidence

continues

TABLE 7.1
Continued

	Begin practicum	Begin internship	Complete doctoral degree
S	1. Beginning ability to identify personal biases that impact the design and implementation of research 2. Ability to explain how a psychologist would collect data to address a local clinical issue	1. Able to design appropriate data collection methods in local clinical settings 2. Engagement in data analysis and synthesis 3. Ability to collect and analyze both qualitative and quantitative data 4. Ability to detect and correct errors in conducting research 5. Ability to develop and manage a major scholarly project 6. Identification of personal biases that impact the design and implementation of research and the application of research findings in clinical settings	1. Ability to design and conduct outcome research (individual client and/or larger participant group) in an applied setting 2. Ability to function as a peer consultant in research design and evaluation 3. Completion of a major scholarly research project 4. Dissemination of scholarly findings to the professional community 5. Ability to identify and attempt to control for personal biases that impact the design and implementation of research and the application of research findings in clinical settings 6. Application of research in local clinical settings
A	1. Appreciation of the role of psychologists in conducting research in applied settings	1. Reflection on personal biases brought to the research process by oneself and by important stakeholders 2. Ability to offer feedback to peers on research design through supervision or consultation	1. Assumption of a leadership role as an evaluator and/or researcher in applied settings 2. Investment in the application of research findings in local clinical settings
	Ethics and professional competence domain		
K	1. Demonstration of a basic working knowledge of ethical principles of research 2. Basic knowledge of the impact of individual and cultural diversity on research	1. Knowledge of ethical principles in research 2. Understanding of the role of diversity issues in the evaluation design and analysis of research	1. Inclusion of diversity issues in the development, implementation, and interpretation of research
S	1. Ability to evaluate research with respect to conformity to ethical standards	1. Ability to design research in conformity with ethical standards	1. Ability to conduct research according to accepted ethical

	2. Description of epistemological model of the integration of science and practice in own program	2. Ability to make mid-course corrections in clinical and research practice based on data 3. Application of ethical principles in research	principles and standards 2. Ability to function as a local clinical scientist in an applied setting
A	1. Openness to Institutional Review Board feedback and research ethics	1. Investment in presenting scientific work for the scrutiny of others 2. Investment in offering constructive feedback to peers 3. Commitment to mid-course corrections in clinical and research practice based on data 4. Endorsement of the importance of the local clinical scientist model to own training as a psychologist	1. Commitment to the importance of research and evaluation in ongoing inquiry and lifelong learning

Note. K = knowledge; S = skills; A = attitudes. From *Competency Developmental Achievement Levels (DALs) of the National Council of Schools and Programs in Professional Psychology (NCSPP),* (pp. 31–34), by the National Council of Schools and Programs in Professional Psychology, 2007. Available at http://www.ncspp.info/DALof%20NCSPP%209-21-07.pdf. Copyright 2007 by the National Council of Schools and Programs in Professional Psychology. Reprinted with permission.

of empirical inquiry in the practice setting (R. L. Peterson, Peterson, Abrams, & Stricker, 1997).

Rigorous professional activity has traditionally been conceived as the application of scientific knowledge developed through laboratory experiments or controlled field research to the understanding and solution of human problems. Although the methodological tools and critical questions associated with controlled research can contribute to clinicians' thinking about their work (Stricker & Trierweiler, 1995; Trierweiler & Stricker, 1992, 1998), something more is needed for clinical inquiry itself. In addition, the local clinical scientist model encourages practitioners to engage the challenge of the individual human condition directly. Starting with an accurate description of the needs of each client, the local clinical scientist model requires that practitioners bring the best available theoretical conceptions, the most useful available research, their careful scientifically constructed understanding of the local circumstances of the case, and their individual and collective professional experience to bear in studying and improving the functional condition of the client. Professional activity as framed by the local clinical scientist model is not just the application of knowledge derived from a separate scientific research process; it is a form of scientific research in its own right, dealing with a range of phenomena largely outside the ken of academic science.

There have been a number of related views on the scientific process of professional work. Most of these discussions focus on the importance of a

critical and careful clinician thought process as a scientific foundation for expert clinical assessment and intervention. Schön (1983, 1987) emphasized expertise as "reflection-in-action." In his work on disciplined inquiry, D. R. Peterson (1991, 1995, 1996b; see also Kanfer, 1990) emphasized a detailed process in clinical work that paralleled what was done in the production of university science. Much later, based on the 2002 Competencies Conference: Future Directions in Education and Credentialing in Professional Psychology, Bieshke et al.'s (2004) work summarized the committee's activities in characterizing the outlook of the person of the psychologist as "scientifically minded." Critical thought is very much a part of the local clinical scientist model as well. But the local clinical scientist model also points to the scientific difficulties in translating statistical science into practice, to the extent it is actually applicable (Cronbach, 1975), and to the realities of accessing empirical phenomena in specific clinical situations. Critical thought for the local clinical scientist is not simply the extension of theoretical and analytic tools from scientific and professional tradition; it is also a performance of careful empirical inquiry in a particular space–time local circumstance. Accurate, realistic description of that circumstance, which is essentially an issue of accurate assessment and measurement, is the foundation for any application of theory or scientific hypothesis (Trierweiler, 2006).

This shift in viewpoint toward the local clinical scientist model carries profound implications for the education of professional psychologists. Instead of mandating statistical, dissertation research—which is often incorrectly equated with nomothetic knowledge and the sole means for contributing to general scientific knowledge in psychology (Lamiell 2003)—as the central requirement of scientific education and training for all practitioners, the local clinical scientist model emphasizes the examination of the empirical realities of the situations and issues actually encountered by practicing professional psychologists.

DISSERTATIONS, SCHOLARLY PRODUCTS, AND RESEARCH CURRICULUM

As presented in detail in chapter 1 of this volume, on the NCSPP model, programs have taken an array of positions regarding the importance of scholarly products for scientific education, ranging from requiring relatively small, clinically oriented doctoral projects to dissertations of the level and quality that might be found in traditional PhD programs. Those programs that require dissertations usually emphasize an applied focus that embodies a broader array of investigative approaches and a wider range of dissertation topics, all of which demonstrate an omnipresent emphasis on disciplined inquiry as basic to clinical education.

The great majority of PsyD programs require a minimum of two courses in research. Variations include a semester of qualitative and another of quantitative; some programs emphasize the consumption of research; some emphasize certain kinds of applied research, such as evaluation or action research; and others focus on local clinical science. Most programs award additional credits to students for preparation of their dissertations in collaboration with a mentor.

THE LOCAL CLINICAL SCIENTIST POSITION

Because the focus was on the research and evaluation competency, the design of the local clinical scientist model stressed scientific and methodological training with an eye toward the investigation of local phenomena. In contrast to the traditional model of the academic scientist working in a university laboratory, local clinical scientists are trained to be

> critical investigators of local (as opposed to universal) realities (a) who are knowledgeable of research, scholarship, personal experience, and scientific methodology; and (b) who are able to develop plausible, communicable formulations for understanding essentially local phenomena using theory, general world knowledge including scientific research, and, most important, their own abilities as skeptical scientific observers.
>
> Although largely compatible with traditional scientific methodological training, this view calls for differing educational practices because it emphasizes (a) being a generalist of knowledge and method, as opposed to a specialist; (b) focusing on local realities, in which data are gathered as they apply to a particular case and may be limited in the extent to which they generalize to other cases; and (c) developing an active inquiring mind as opposed to concentrating on technical expertise with scientific methods. In effect, methodological training can neither be put aside, nor can it simply continue to echo traditional university training. Rather, it must be explicitly integrated with the interests of the active professional. (Trierweiler & Stricker, 1992, p. 104)

The local clinical scientist model conceptualizes a collection of phenomena that previously had not been identified as relevant to scientific inquiry in practice and are rarely even discussed in our science, inasmuch as academic science has almost exclusively emphasized statistical description of quantitative variables as opposed to specific individual descriptions. These broad classes of empirical observation in the local clinical situation include the description of (a) specific instances of empirical phenomena in an individual's life that can be described by categories from psychological theory or scientific hypotheses; (b) specific instances of how sociocultural, economic, gender, or ethnicity considerations may affect data gathering and interpretation in a particular local clinical situation; (c) specific aspects of an individual's

personal experience, communication, biography, and development that may be germane to the case and to data gathering within the case; and (d) specific aspects of space-time moments in the clinical interaction and relationship that may affect intervention, outcome, and ongoing inquiry (Trierweiler, 2006; Trierweiler & Stricker, 1998).

The scientific data of practice primarily involve behavioral observations and face-to-face communications with clients and significant others. Formal psychological assessment procedures also may be used. If richly described, the classes of local empirical observation would provide a sizable and thorough database from which to engage scientific hypotheses and for conceptualizing clinical problems and interventions regardless of the theoretical or empirical background of a particular clinical problem or therapeutic approach. Alternatively, when these classes of observation are ignored or incompletely described or linked to the empirical realities of time-extended client behavior and self-report, it might be said that the clinical endeavor is straying from a rigorous scientific approach (Trierweiler, 2006).

By implication, we do not consider application of theory or the findings of psychological research studies to constitute rigorous scientific practice unless they are carefully coordinated with the local empirical realities of a clinical case (namely, specific self-reports and behavioral observations). For example, yes-and-no answers to a few generic diagnostic questions—as is often encouraged in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association, 1994) diagnosis—do not provide sufficient scientific foundation for specific clinical diagnoses without extensive and careful coordination of those answers with the particulars of the case (e.g., to ensure that the clinician and patient are talking about the same phenomena in the individual's life). This is especially true when the underlying classification system itself is scientifically weak (e.g., Follette & Houts, 1996). Pretending that a system like the *DSM–IV* takes precedence over other approaches because it looks, or is asserted to be, scientific when reliabilities are low (albeit asserted to be adequate) and validity is virtually unknown does not make for dependable science. Any generalized taxonomy is only as good as its ability to completely describe and classify naturally occurring empirical phenomena. With human psychology, there is little evidence that the *DSM* or any other system comprehensively classifies the unique mental health related issues and situations that humans confront in their lives (e.g., Messer, 2004; Wakefield, 1992; Westen, 1998). Aggregating an already weak classification system using statistical techniques does not improve on the fundamental issues of connecting conceptual understanding and intervention to real phenomena in the lives and experience of individuals. As was understood in the early days of the scientist–practitioner model, only a wise and well-informed scientific practitioner, using methodological tools appropriate to the situation, can accomplish such individualized preci-

sion (American Psychological Association [APA], Committee on Training in Clinical Psychology, 1947).

In short, contrary to much recent rhetoric about scientific evidence in practice, statistical studies do not provide strong empirical and logical foundation for simplified applications of scientific study procedures to the local circumstances of clinical practice (Chronbach, 1975; Lamiell, 1981; Shakow, 1976; Trierweiler, 2006, Trierweiler & Stricker, 1998). Similarly, clinicians' usage of clinical theories, fashionable clinical hypotheses, or cultural stereotypes (e.g., dreams reflect unconscious transference issues, memory blocks mean some prior trauma, relationships between the sexes are usually about power issues, Hispanic patients are family-oriented) requires careful coordination with specific clinical data to be rigorously applied. Overly free usage of theories and research results (which come to the clinical situation as working hypotheses), as is often seen in the popular media, can, without careful assessment, actually be antiscientific and potentially misguided.

The local clinical scientist model suggests that assessment of empirical realities of a case is more involved than is suggested by simple Q & A diagnostic procedures (e.g., the patient says he is sad and has sleep problems; therefore, medication is needed). It must be remembered that such methods originate in the instrumental requirements of large-scale population studies, and, therefore, they are often deficient in procedures for uncovering the information needed to coordinate the meaning of research (e.g., diagnostic) concepts with local data (Trierweiler, 2006). Extensive individualized data are required as grounds for making scientifically sound diagnostic interpretations. At the same time, rigorous assessment based on the local clinical scientist model is more involved than is typically found in clinical practice models. As a scientific perspective relevant to any theory or mode of practice, it is more empirically focused and event-driven than is often found in therapy training models, in which theoretical perspectives govern the clinical process and conclusions may be drawn prematurely (e.g., the patient mentioned a time that she cannot remember, therefore, she was abused). To be well grounded in life particulars, all self-report and behavior-based interpretations need to be understood in terms of the individual's life as he or she actually experienced it across time and situation—not in terms of a clinician's or clinical system's belief or conjecture about how that life was experienced. The most powerful tools the local clinical scientist has in the assessment process are a good relationship with the patient, which enhances the probability that the needed information can become available, and the ability to ask exactly what a particular event or idea means to the person in the service of a clinical intervention. The local clinical scientist is, first, a gatherer of clinical data from a complex individual life stream and only later an interpreter of those data.

Trierweiler (2006) called this careful coordination between empirical observations in the local clinical situation and research or theory-based hy-

potheses *methodological realism*. From this perspective, it is hard to imagine a typical mental health medical visit in the contemporary United States that is more than cursorily scientific. Instead of acknowledging and scientifically overcoming the complexities of human self-report, many professionals seemed to have succumbed to the social and economic press to be scientific by adopting procedures that lend the appearance of science without careful attention to the issues and weaknesses involved. Too often, it is form without substance. Psychologists working in medical settings or with patients with prior medical experience often have to manage the consequences of this lack of psychological rigor in the typical medical examination. The local clinical scientist model has far-reaching implications for defining the empirical evidence of psychological practice, coordinating those data with scientific study results and with clinical theories, and determining the level of training that would be required to accomplish these complex interpretations (it is relevant to all clinical endeavors but best realized only at the highest level of scientific and clinical training in the field). The model is highly compatible with the traditional scientist–practitioner and practitioner–scholar models but more explicit about the methodological issues involved in extending psychological science into the realities of lived experience.

Insofar as the local clinical scientist model fully incorporates both the strengths and weaknesses of scientific methods, including critiques such as those by Manicas and Secord (1983) or Hoshmond and Polkinghorne (1992), it is not surprising that the literature since the original statement of the local clinical scientist model has been somewhat confused about the scientific commitments of the model and the extent to which it conceives of practitioners as only consumers of the scientific knowledge products of academic scientists. Also, there have been suggestions that the model merely represents attempts to implement scientific evaluations in clinical contexts or that, at least in informal comments, it condones the status quo in the ways clinicians and scientists operate. Whereas we endorse scientific endeavors of all stripes, we want to say unequivocally here that such limited characterizations of the local clinical scientist model are inaccurate and avoidant of central issues and critiques of conventional practice identified by the model. The local clinical scientist model has always had much greater ambitions than just advocating the "consumption" of existing science, focusing instead on (a) the longstanding problem of teaching the root logic of scientific methods to practitioners, (b) a critical analysis of scientific approaches as widely implemented in contemporary psychology and psychiatry, and (c) the adequacy of scientific presentations to the needs of practitioners. Some seem to imply that only those working in academic settings, producing "knowledge" by publishing in peer-reviewed journals, can claim scientific status. Again, we take issue with such characterizations: Major scientific and technical advancements are being made in the private sector in a variety of fields, and psychology is no exception, having long demonstrated a rich tradition of scholarly

discourse that influences both scientific and clinical endeavors. The local clinical scientist raises serious questions about the ongoing practices of both existing scientists and practitioners. As such, it is antithetical to any version of guild-level parochialism, be if from practice or academic science. Only open, critical dialogue that is true to the scholarly traditions of psychology can lead to needed advances in managing the science–practice interface (Peterson & Trierweiler, 1999; Trierweiler, 2006).

As was pointed out in the original statement of the model, the local clinical scientist is very much a scientist in our vision but with a focus different from his or her academic colleagues:

> Historically, training has emphasized skills necessary for scientific knowledge production, whereas scientific skills related to local clinical analysis have received relatively less explicit attention. In contrast to traditional training models, we propose that professional psychology programs develop and expand the early insight that the professional psychologist is a local clinical scientist (e.g., Shakow, 1976). We take as self-evident the need to continue also to train clinicians who will be devoted to the production of scientific psychological knowledge. The major difference between the traditional training model and the model we propose is that, in our model, the capacities necessary for local clinical science and scientific knowledge production do not need to be developed fully in the same individuals.
>
> We also differ from the Boulder formulation [i.e., the original statement of the scientist–practitioner model as documented in Raimy (1950)] because we do not agree with the grim implication that scientific "adaptability" to local circumstances requires "suspension of highly critical, analytic concern [in response to the] 'unscientific' demands of clinical reality" (Raimy, 1950, p. 86). Indeed, the essence of the training problem is to help students to conceptualize clinical judgment and decision making in a way that critical analysis of the local evidence, required to establish a fit between clinical theory, data, and action, is in the foreground of the clinician's concerns. We can accomplish this if we conceptualize research training explicitly as training in critical thinking, and as a means to instill scientific attitudes. (Trierweiler & Stricker, 1992, p. 105)

Most important, the local clinical scientist model is grounded in logic of scientific methodologies as they have developed in psychology, including accomplishments and controversies, appropriate extensions and limitations. But, in contrast to traditional training, these tools are taught as a contribution to developing the attitude and thinking skills needed for localized inquiry and individualized analysis as opposed to conducting research that describes properties of statistical variables for packaging in a scientific journal. Trierweiler and Stricker (1998) wrote the *Scientific Practice of Professional Psychology* in support of this endeavor, to elaborate the broad and rigorous

conceptual foundation for extrapolating methodological thought into practice that has long existed in psychology. In conjunction with other comprehensive methodology textbooks, the book establishes a vision of scientific professional inquiry that is well grounded in the core methodological scholarship of scientific psychology, brings together in one place the full range of quantitative and qualitative approaches to scientific inquiry in psychology, and directly addresses both critical strengths and weaknesses of different methods. It is the only work to date in the literature to address the complexities of such an integration of core scientific methodological thought and the empirical realities of practice. And, it represents one of the few discussions in the literature of the logical problems associated with drawing individual clinical inferences from statistical results (see also, Cronbach, 1975; Lamiell, 1981, 2003; Trierweiler, 2006).

However, this process moves beyond simply following the suggestions from scientific outcome studies. Even these seemingly directly practice-relevant studies require careful translation into the local clinical situation (Trierweiler, 2006). Such translation will be more or less complicated and involved depending on similarities between the operation of a particular clinical intervention and the characteristics of study samples. Beyond these outcome and therapy process formulations, any scientific finding is potentially relevant as clinicians attempt to understand and interpret the time-extended realities of clients. One might say that the task is to understand the clinical situation in terms of an empirically grounded conceptualization that is consistent with the general picture of the reality that science suggests surrounds us.

THE LOCAL CLINICAL SCIENTIST IN PRACTICE SETTINGS

The local clinical scientist model encourages clinicians to actively model the reality of the clinical situation using empirical observation, careful analysis of self-reports, and knowledge from science and practice traditions. There are myriad examples of the local clinical scientist functioning in clinical settings. We can divide them into three general categories: (a) the individual practitioner, (b) the helpful review, and (c) the research program.

The individual practitioner is the ultimate focus of this model. With the increasing number of graduates of professional schools and the frequent adoption of the local clinical scientist by these programs (cf., the NCSPP model, chap. 1, this volume), we can expect to see more and more individual practitioners who have been influenced by this approach. Because the work goes on in the privacy of individual offices in local settings, it is difficult to document the prevalence of practice, but we are hopeful that there are an increasing number of practitioners who do function as local clinical scientists. Certainly, the authors of this chapter have been told on many occa-

sions by individuals that they appreciated the articulation of the model and are influenced by it; unfortunately, when they describe what they do, as we have tried to spell out, it may not be what we had in mind.

Research reviews geared to the practitioner are also quite helpful in aiding the individual practitioner in keeping relevant research findings in mind when they devise treatment plans and strategies. APA publishes a monthly newsletter, the *Clinician's Research Digest*, which presents summaries of research that is relevant to the practitioner. Individual practitioners are made aware of these studies and can request reprints if there is direct application to their practice. The journal of APA's Division of Psychotherapy (29), *Psychotherapy: Theory, Research, Practice, Training*, has begun to publish Practice Reviews (e.g., Mobini & Grant, 2007), articles that summarize research literature relevant to a particular area of practice. In addition to these innovative approaches, there are many traditional research reviews for the practitioner to draw on (e.g., Westen, 1998).

The most ambitious implementations of the local clinical scientist model are research programs designed to aid the practitioner in daily functioning, combining the value of the statistical findings with the local needs of more individual inquiry. One such approach consists of the construction of Practice Research Networks (PRNs; e.g., Borkovec, Echemendia, Ragusea, & Ruiz, 2001), a program that combines the research acumen of scientists with the daily experience of practitioners who function in local settings. Data drawn from these practices are combined to develop indications of general practices and their outcomes. An additional approach that can be recommended is the lengthy program designed by Lambert (Harmon, Lambert, Slade, Hawkins, & Whipple, 2005; Lambert, Harmon, Slade, Whipple, & Hawkins, 2005). In this program, data are accumulated from a large number of practitioners, and, from this, expected progress can be charted and provided to each individual practitioner. If a particular case is not showing expected progress, the treatment plan can be modified. Clients have shown increased positive change as a result of these alterations in the plan. It is one thing to exhort the practitioner to learn from experience. It is entirely another to document that experience so that faulty heuristics (Tversky & Kahneman, 1974) do not lead to errors in memory. Both PRNs and the Lambert program are approaches to systematic documentation and will serve the local clinical scientist well.

THE LOCAL CLINICAL SCIENTIST IN TRAINING SETTINGS

As has been said, the local clinical scientist model is an important aspect of the practitioner–scholar model, (or, when the words are reversed) the scholar–practitioner model and the practitioner model (R. L. Peterson et al., 1997; chap. 1, this volume). Because most clinical training programs do not

limit their model statement to naming the local clinical scientist, there is no reliable source of data on the prelevance of the model's implementation. Based on data obtained from the APA Center for Psychology Workforce (J. Kohout, personal communication, January 9, 2008), at least 62 doctoral programs identify their model as one of these variants. Still, because of the way the question was worded, these data may not be reliable. There are at least 18 programs that identify their programs as having been influenced by the local clinical scientist vision (J. Skidmore, personal communication, January 8, 2008), including other programs that have e-mailed author R. Peterson independently). When Peterson was on the Committee on Accreditation (1999–2004), it was his impression that a large number of internships identified part of their training model as local clinical scientist, though no formal numbers were kept. The Citations Index reports that between 1996 and 2007, the Stricker and Trierweiler *American Psychologist* (1995) article was cited an average of 5.23 times per year. Although this is a fairly sizable number of citations for an article on training, it appears that the local clinical scientist model has been much more influential in the training community than in more general psychological writing.

FUTURE DIRECTIONS

As Trierweiler (2006) has suggested, a clear next step is to develop a clinical and scientific literature describing how scientific studies can be meaningfully extended into local clinical situations. Such a literature should involve three areas of development. First, the limitations of statistical research conclusions for the local clinical scientist need to be addressed directly in studies that might pertain to clinical practice (Trierweiler, 2006). Theory appropriate to translation of research studies into the clinical setting must be developed. Second, we need to strengthen our understanding of self-report and behavior observation in the clinical setting as the most direct empirical methods for accessing the realities of clients' time-extended lives. In part, this work will involve examination of how concepts clients use are attached to the directly experienced and remembered aspects of their lives (Trierweiler, 2006; Trierweiler & Donovan, 1994). Third, the clinical endeavor is almost entirely about observation, recognition, and interpretation of mental health-related life issues in the context of a developing professional relationship with the client. These performance aspects of information gathering and clinical judgment need to be acknowledged as central to the larger project of scientifically describing clinical thought both as they pertain to traditional issues such as diagnosis (e.g., Trierweiler, 2006) and as they affect conceptualization of clinical process and intervention. The local clinical scientist model is more than just a training concept: It points to a realm of naturalistic scientific inquiry that is dauntingly familiar to novice and expe-

rienced clinicians alike. The wish to bring science into practice will only come to fruition when this realm is realistically and fully included in the larger training, scholarly, and scientific discourse of psychology along with the well-established and currently dominant output of statistical science. Much work remains to be done.

REFERENCES

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

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

Bieschke, K. J., Fouad, N., Collins, F., & Halonen, J. (2004). The scientifically-minded psychologist. *Journal of Clinical Psychology, 60,* 713–724.

Borkovec, T. D., Echemendia, R. J., Ragusea, S. A., & Ruiz, M. (2001). The Pennsylvania practice research network and future possibilities for clinically meaningful and scientifically rigorous psychotherapy effectiveness research. *Clinical Psychology: Science and Practice, 8,* 155–167.

Cronbach, L. J. (1975). Beyond the two disciplines of scientific psychology. *American Psychologist, 30,* 116–127.

Dawes, R. M. (1994). *House of cards: The collapse of modern psychotherapy.* New York: Free Press.

Follette, W. C., & Houts, A. C. (1996). Models of scientific progress and the role of theory in taxonomy development: A case study of the DSM. *Journal of Consulting and Clinical Psychology, 64,* 1120–1132.

Harmon, C., Lambert, M. J., Slade, K., Hawkins, E. J., & Whipple, J. S. (2005). Improving outcomes for poorly responding clients: The use of clinical support tools and feedback to clients. *Journal of Clinical Psychology/In Session, 61,* 175–185.

Hays, S. C. (1986). A training model in search of a rationale. *American Psychologist, 41,* 593–594.

Hoshmand, L. T., & Polkinghorne, D. E. (1992). Redefining the science–practice relationship in professional training. *American Psychologist, 47,* 55–66.

Kanfer, F. H. (1990). The scientist–practitioner connection: A bridge in need of constant attention. *Professional Psychology: Research and Practice, 21,* 264–270.

Lambert, M. J., Harmon, C., Slade, K., Whipple, J. S., & Hawkins, E. J. (2005). Providing feedback to psychotherapists on their patients' progress: Clinical results and practice suggestions. *Journal of Clinical Psychology/In Session, 61,* 165–174.

Lamiell, J. T. (1981). Toward an idiothetic psychology of personality. *American Psychologist, 36,* 276–289.

Lamiell, J. T. (2003). *Beyond individual and group differences: Human individuality, scientific psychology, and William Stern's critical personalism*. Thousand Oaks, CA: Sage.

Manicas, P. T., & Secord, P. F. (1983). Implications for psychology of the new philosophy of science. *American Psychologist, 38*, 399–413.

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

McFall, R. M. (1996). Making psychology incorruptible. *Applied and Preventive Psychology, 5*, 9–16.

Messer, S. B. (2004). Evidence-based practice: Beyond empirically supported treatments. *Professional Psychology: Research and Practice, 35*, 580–588.

Mobini, S., & Grant, A. (2007). Clinical implications of attentional bias in anxiety disorders: An integrative literature review. *Psychotherapy: Theory, Research, Practice, Training, 44*, 450–462.

Peterson, D. R. (1985). Twenty years of practitioner training in psychology. *American Psychologist, 40*, 441–451.

Peterson, D. R. (1991). Connection and disconnection of research and practice in the education of professional psychologists. *American Psychologist, 46*, 422–429.

Peterson, D. R. (1995). The reflective educator. *American Psychologist, 50*, 975–983.

Peterson, D. R. (1996a). Making conversation possible. *Applied and Preventive Psychology, 5*, 17–18.

Peterson, D. R. (1996b). Making psychology indispensable. *Applied and Preventive Psychology, 5*, 1–8.

Peterson, D. R., & Peterson, R. L. (1997). Ways of knowing in a profession: Toward an epistemology for the education of professional psychologists. In D. R. Peterson, *Educating professional psychologists: History and guiding conception* (pp. 191–228). Washington, DC: American Psychological Association.

Peterson, R. L., Peterson, D. R., Abrams, J. C., & Stricker, G. (1997). The National Council of Schools and Programs of Professional Psychology educational model. *Professional Psychology: Research and Practice, 28*, 373–386.

Peterson, R. L., & Trierweiler, S. J. (1999). Scholarship in psychology: The advantages of an expanded vision. *American Psychologist, 54*, 350–355.

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

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.

Shakow, D. (1976) What is clinical psychology? *American Psychologist, 31*, 553–560.

Stricker, G. (1992). The relationship of research to clinical practice. *American Psychologist, 47*, 543–549.

Stricker, G., & Trierweiler, S. J. (1995). The local clinical scientist: A bridge between science and practice. *American Psychologist, 50*, 995–1002.

Trierweiler, S. J. (1987). Practitioner training: A model with rationale intact. *American Psychologist, 42*, 37–45.

Trierweiler, S. J. (2006). Training the next generation of psychologist clinicians: Good judgment and methodological realism at the interface between science and practice. In C. D. Goodheart, A. E. Kazdin, & R. J. Sternberg (Eds.), *Evidence-based psychotherapy: Where practice and research meet* (pp. 211–238). Washington, DC: American Psychological Association.

Trierweiler, S. J., & Donovan, C. M. (1994). Exploring the ecological foundations of memory in psychotherapy: Interpersonal affordance, perception, and recollection in real time. *Clinical Psychology Review, 14*, 301–326.

Trierweiler, S. J., & Stricker, G. (1992). Research and evaluation competency: Training the local clinical scientist. In R. L. Peterson, J. McHolland, R. J. Bent, E. Davis-Russell, G. E. Edwall, E. Magidson, et al. (Eds.), *The core curriculum in professional psychology* (pp. 103–113). Washington, DC: American Psychological Association and National Council of Schools of Professional Psychology.

Trierweiler, S. J., & Stricker, G. (1998). *The scientific practice of professional psychology*. New York: Plenum.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*, 1124–1131.

Wakefield, J. C. (1992). The concept of mental disorder: On the boundary between biological facts and social values. *American Psychologist, 47*, 373–388.

Westen, D. (1998). The scientific legacy of Sigmund Freud: Toward a psychodynamically informed psychological science. *Psychological Bulletin, 124*, 333–371.