

# *the* Behavior Therapist

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### *From the Editor*

## Science in Practice

Welcome to *tBT*'s Science Special Issue. Contributors to this issue remind readers of the importance of nurturing skepticism, avoiding cynicism, and exploring the implications of this for clinical practice. Importantly, we offer perspectives from all experience levels—luminaries from the Science and Pseudoscience Special Interest Group (e.g., Lilienfeld, Lohr, McNally, & Stickle) and young behavior therapists who have become passionate about more strongly emphasizing “science” in their training as scientist-practitioners (e.g., Miller & McLean). Another contribution to the issue speaks to the possibilities for humor (Cogswell & Holaway) in the science and pseudoscience domain.

As we near the end of my term as editor, I sincerely wish to thank my Editorial Board and the staff at our ABCT offices in New York, especially Stephanie Schwartz and David Teisler. On behalf of the *tBT* editorial team, I also wish to thank other members of ABCT's Publications Committee under the leadership of outgoing Publications Coordinator Judy Favell. Special mention is also warranted for the incoming *tBT* editor, Drew Anderson. In the coming months we'll provide more information about how to contact Drew and his new editorial team. In the interim, we hope that you enjoy this and our upcoming issues in Volume 30. Last but not least, we'd like to express our gratitude to you, the members of ABCT, for your role in keeping *tBT* a vibrant forum for the exchange of ideas about the future of this organization and behavior therapy as a whole.

—DAVID REITMAN, PH.D.  
Editor, *the Behavior Therapist*  
Volumes 28–30



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## Are You a Hedgehog or Fox? On the Merits of Developing a Secondary Interest in Science and Pseudoscience

Nathan A. Miller and Carmen P. McLean, *University of Nebraska–Lincoln*

Combing through the ABCT conference program book weeks (or even months) ahead of time with highlighter in hand is an annual ritual in our department. While engaging in this tradition with nerdy contentment, the meeting of the “Science and Pseudoscience” Special Interest Group (SIG) caught our attention. As scientifically minded, evidence-driven clinical psychologists in training, we would occasionally cede to the temptation of poking fun at newfangled bogus therapies and related claims. However, we had never really thought about how ABCT was addressing the threat of pseudoscience in psychology or, further, how we might become involved in this important issue.

Although intent on studying anxiety disorders, issues related to pseudoscience appealed strongly to our sensibilities for reasons that were not readily apparent at the time. We turned to our mentor (Debra Hope) for guidance. She explained that although this topic did not fall within her professional scope of interest per se, she strongly encouraged us to attend the meeting. “Perhaps this could be a second area of interest for you two,” she wondered aloud (as many good advisors do). A second area of interest? We weren’t exactly sure what this meant, but it sounded like more work.

Like many graduate students, we are reflexively protective of our time and avoid committing ourselves without carefully weighing the costs and benefits to our careers. But after considering the many opportunities that could result from pursuing a second area of interest, and further realizing how preoccupied we were with the topic, we tentatively resolved to attend the SIG meeting at a recent ABCT conference.

Our first attendance at the Science and Pseudoscience SIG was memorable. Our initial apprehension dissipated as members trickled in and a spirited yet serious discussion enlivened the room. The session roused our inner empiricist/activist, our minds churning on incipient possibilities. The SIG

members expressed an earnest desire for wider dedication to science and pseudoscience among ABCT members. We left the conference with the feeling that our efforts would be much needed in the SIG and larger ABCT community and (hopefully) rewarded. We grew confident that our enthusiasm toward science and pseudoscience was more than an affinity for debunking and, though we remained unsure of how best to pursue this secondary interest, we knew there was room for us to contribute.

So, we did what every good graduate student might do (when feeling full of energy and interest but lacking in content knowledge and experience) and dove head-first into the literature. We hardly came up for air. As the articles passed between us and books were traded, we became engrossed. It is with slight embarrassment that we admit that winter holidays, cruise vacations, and even (gasp!) a honeymoon were spent reading books on pseudoscience. In doing so, we found ourselves fascinated with new ideas and constructs coming from sources we never knew existed (e.g., *The Skeptical Inquirer*). In fact, we found that this secondary interest enriched our knowledge about topics that had implications for our primary areas of interest as well (e.g., pseudoscientific treatments for anxiety disorders). It was at this time we also recognized that an advantage of pursuing a secondary interest is the newfound vigor that comes with an intellectual change of pace. We felt a greater sense of freedom in this new area. There were no commitments, no deadlines, and we could work at our own pace, often not returning to the topic of pseudoscience for weeks at a time as our schedules permitted.

A consistent message throughout our readings was the apparent paucity of research examining whether students emerge from undergraduate and graduate training equipped with the competencies to identify and defend against the real and growing threat of pseudoscience. Although some

psychology curricula offer elective courses on science and pseudoscience, most programs assume that a skeptical perspective and the commensurate critical thinking skills are taught implicitly in research methods and statistics courses, and across psychology courses and clinical training more generally. We became curious about the validity of this assumption. As it turns out, we found evidence that many students emerge from psychology courses relatively deficient in such skills (McBurney, 1996), and that the inherent difficulty in learning from clinical experience can cause even well-trained clinicians to continue to use pseudoscientific methods and treatments that don’t work (Garb & Boyle, 2003). We decided to begin by investigating these issues at the undergraduate level. Do psychology students acquire these skills without explicit instruction? If not, do courses in science and pseudoscience help?

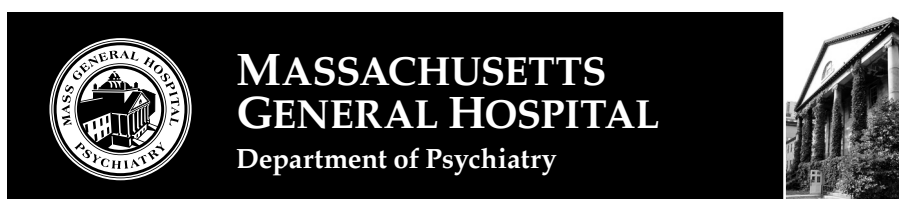
After sharing these questions with our advisor, she suggested that we co-teach a course on science and pseudoscience as part of an advanced teaching practicum offered at our institution. As it turned out, our department offered an undergraduate course on science and parapsychology that was developed by Donald Jensen (a former faculty member with a strong interest in debunking). Unfortunately, the course had not been taught for a couple of years for lack of an available instructor. Enter the eager graduate students. We could hardly believe how many doors our secondary interest was opening. This course offered us an ideal opportunity to combine our research and teaching interests by allowing us to design a research project to coincide with the course implementation. The subsequent study we developed examines changes in critical thinking and paranormal beliefs following courses that teach critical thinking explicitly (such as our science and parapsychology course) versus implicitly (such as courses in research methods and statistics). Both the course and the IRB-approved research project are under way, so stay tuned for a full report.

In addition to presenting research related to our primary interest area, we felt it only natural to incorporate our burgeoning interest at the 2005 ABCT conference in Washington, DC. In formulating how we might contribute, we noted that despite a strong tradition at ABCT of emphasizing scientific rigor in clinical research and practice, there was relatively little attention on how best to impart important scientific and critical thinking skills to students and clinicians. Given our novice status in this area,

we agreed that a panel discussion with leading experts would be a perfect venue to “get the ball rolling.” We now found ourselves developing relationships with leading researchers in another field, an opportunity that likely would not have arisen without this secondary interest. After carefully preparing e-mails (i.e., neurotic spell-checking and proofreading) to solicit participation from potential panelists, we nervously sent them off to the various authors whose books and articles had sparked our interest in pseudoscience. Fortunately, our hesitation was proven unfounded [Note to self: Evidence did not support anxious automatic thought] as our solicitation was welcomed with praise and enthusiasm across the board.

The thoughtful contributions of Scott Lilienfeld (Emory University), Jeffery Lohr (University of Arkansas), Richard McNally (Harvard University), Timothy Stickle (University of Vermont), and Sheila Woody (University of British Columbia) ensured that the panel discussion, “Teaching Students to Think Like Scientists,” was standing room only (see this issue of *tBT* — p. 84—for a firsthand account!). As expected, the discussion covered topics such as empirically supported treatments, debunking bogus therapies, and the like. However, perhaps the most salient and rewarding aspect of the discussion was that the venue provided a platform for representatives from master’s-level and other more clinically oriented programs to voice their concerns and questions. A theme emerged regarding how students develop critical thinking skills and the effectiveness of their training in imparting these skills. As is the case in any good scientific debate, many important issues were raised and few questions were fully resolved. The panel and subsequent interactions with panel members provided us ample discussion material in the undergraduate class we are presently teaching.

Teaching an undergraduate course on science and pseudoscience conveyed an enviable degree of creative freedom, and we couldn’t wait to cash in. We recognize that while most of our students will not pursue postgraduate degrees in the field, they are all consumers of scientific information through media and popular culture. A key learning objective of the course is to change “skepticism” from a four-letter word to an intermediate approach that appropriately balances credulity and cynicism. To best exemplify the principles of critical thinking, we have worked hard to conceal our own personal opinions, particularly in suppress-



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ing temptations to ridicule various claims we perceive as bogus. Knowing that students feel pressured to acquiesce to classroom authority, we have tried to let the scientific method speak for itself by presenting students with the available data regarding various claims (e.g., astrology, facilitated communication) and common errors in thinking, trusting that allowing them to decide for themselves will prove a more powerful teaching tool. In the end, we hope that our students learn as much as we have learned teaching this course.

We would not have predicted that indulging our curiosity for a secondary interest would lead to the instructive and gratifying experiences we have described. Given this positive situation, we strongly recommend “double dipping” your graduate training possibilities. Exploring a second area of interest can add valuable breadth to one’s training and increase opportunities for teaching, research, policy, and (critical for young professionals) networking. We feel fortunate to have had the support and encouragement of our mentors to explore a

topic that we are now unexpectedly passionate about. In pursuing a secondary interest, we suggest you explicitly inform your advisor of your interests and enlist his or her support. Your advisor's wisdom and connections are likely to be invaluable. While there are barriers, such as lack of time and the need to balance the breadth with the depth of our training, we feel that the benefits have far outweighed the costs.

Most graduate students probably encounter new ideas that rouse their intellectual curiosity fairly frequently. Such experiences may well be common in progressive fields like psychology. Many of us are taught that it is important to resist the temptation to pursue additional topics in lieu of gaining proficiency in a primary interest area—that it is important not to spread yourself so thin that your CV suggests that you lack focus or that you can't offer any clinical or research expertise. However, an overly narrow focus early in your career may stifle opportunities to explore new areas about which you are passionate. This issue was recently discussed by Taylor, McKay, Abramowitz, Asmundson, and Stewart (2006), who, borrowing terms from Berlin (1952), concluded that the “hedgehog” approach to research and publishing (focusing on a specific topic) was preferable to the “fox” approach (research on diverse topics) early in one's career. However, we believe that secondary interests, well managed, offer significant unique benefits that can be tapped without being viewed as too “foxy.”

Following our suggestions will most certainly consume valuable time, but our experience strongly suggests that it will not be

time squandered. Indeed, there are many areas of psychology that require the attention of young energetic minds (even on a part-time basis). As a final piece of advice, we recommend choosing a secondary interest area for which a lack of prior expertise would not preclude contributions likely to have broad implications for the field. In the spirit of our successful secondary interest area, we leave you with guidance from the heavens:

### Horoscope

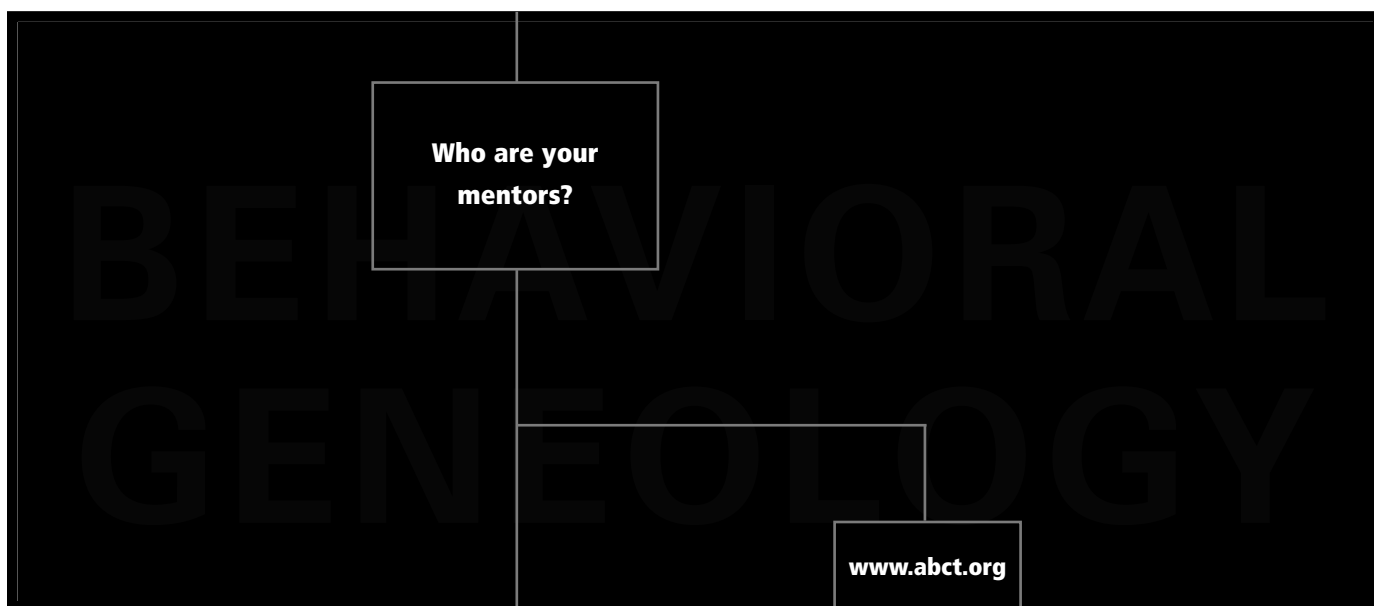
(For those born between 1925 and 1995)

You are a hard-working psychologist who cares deeply about the issues that are important to you, but you tend to care less about unimportant issues. With Venus overlapping with the moons of Jupiter, you should pay close attention to career advice you receive this month, as it has the potential to change your path in important ways. You will find yourself reflecting on the things you are passionate about, and may consider exploring other interests. Your head is in the clouds this month, as you daydream about how you could pursue other interests and combine professional activities in ways that would prove exceedingly rewarding. Share your ideas with others, and take advantage of the guidance and feedback you receive from informal and formal mentors alike. This fall, gatherings of like-minded professionals will provide you with perfect opportunities to network and collaborate with others whose work and career paths you respect and admire. If all else fails, listen intently to your inner child, try a chakra massage, or let out a primal scream.

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## Teaching Students to Think Like Scientists

Carmen P. McLean and Nathan A. Miller, *University of Nebraska–Lincoln*, Scott O. Lilienfeld, *Emory University*, Jeffrey M. Lohr, *University of Arkansas*, Richard J. McNally, *Harvard University*, and Timothy R. Stickle, *University of Vermont*

**F**uture psychologists must be well versed in the critical thinking skills that enable them to distinguish science from pseudoscience. Without formal training in these skills, the proliferation of pseudoscience through popular media threatens the legitimacy and integrity of our field. One way to confront this ongoing challenge is to train students to think scientifically, rationally, and skeptically.

At the 2005 ABCT conference in Washington, DC, five experts in clinical science were invited to participate in a panel discussion titled “Teaching Students to Think Like Scientists.” Panel members included Scott O. Lilienfeld (Emory University), Jeffrey M. Lohr (University of Arkansas), Richard J. McNally (Harvard University), Timothy R. Stickle (University of Vermont), and Sheila Woody (University of British Columbia). The session was well attended and enthusiastically praised by attendees. The success of the panel discussion was doubtless a function of the renown of the panel members, but also suggested that teaching aspects of scientific thinking skills may be a neglected topic within ABCT. To facilitate dissemination of the discussion proceedings to a broader audience, each panelist was asked to prepare responses to the set of questions that follows. The present work reflects the authors’ written responses to questions originally posed during the panel discussion, which was moderated by Carmen P. McLean and Nathan A. Miller from the University of Nebraska–Lincoln. Although Sheila Woody was unable to contribute directly to this paper, her contributions to the panel discussion are reflected in the responses of the other panel members appearing below.

### *What does it mean to be a “scientist” as a behavior therapist?*

**JEFFREY M. LOHR:** It means that at a minimum, the behavior therapist should be a scientific clinician, and at best, a clinical scientist. The behavior therapist’s knowledge base should almost exclusively contain empirical principles of change. The thera-

pist should learn sufficient breadth of application to accommodate empirically derived procedures to the functional analysis of the single case. That is, the student in training should acquire knowledge of empirically supported principles of change and the experimental methods used to validate treatment efficacy. The therapist should know how to apply experimental methods to the single case in order to conduct empirical treatment evaluations to determine whether the empirically validated procedures applied have resulted in benefit to the individual.

**SCOTT O. LILIENFELD:** To me, most of what we mean by scientific thinking is best summed up by the late Nobel Prize–winning physicist Richard J. Feynman’s aphorism that the essence of science is bending over backward to prove ourselves wrong. In more technical lingo, we can perhaps say that the essence of science is the continual effort to compensate for confirmation bias, a propensity that afflicts clinical researchers and practitioners alike. I would even go so far as to say that most of the skills that fall under the broad rubric of “critical thinking” in psychology can be thought of as tools designed to overcome cognitive biases, confirmation bias foremost among them. I would argue that two sets of critical thinking skills are paramount: (1) knowledge of biasing factors that can lead all of us toward cognitive illusions (e.g., confirmation bias, illusory correlation, hindsight bias) and (2) an understanding of research designs that can help us to overcome these ubiquitous biasing factors.

**RICHARD J. McNALLY:** There are at least three senses in which a behavior therapist might function as a scientist. First, a therapist may conduct and publish research in addition to treating patients. But this is more a matter of the person having two distinct jobs—therapist and researcher—rather than functioning as a scientific therapist per se. Second, a therapist may track the progress of patients by collecting data. Single-case experimental designs applied to therapy cases constitute the clearest

exemplar. Third, a therapist’s clinical work may be informed and guided by the best knowledge we have regarding efficacious interventions. This amounts to evidence-based practice, and is the most important sense in which a therapist can function scientifically. Large social and economic forces are transforming the practice landscape, and a failure of therapists to keep abreast of developments in evidence-based therapy will be fatal to the therapist’s career.

### *What skills are most relevant to clinical training?*

**JEFFREY M. LOHR:** Experimental methods are the most technically teachable aspect of the self-corrective process that separates empirical epistemology from other forms of knowing. It is based on the concept of disconfirmability of theories, hypotheses, and predictions that follow from them. Unfortunately, training in intensive design methodology in clinical application is no longer provided in many clinical training programs that identify themselves as “evidence-based.” If students do not acquire these skills, they can claim no special expertise in science-based practice.

**TIMOTHY R. STICKLE:** Numerous errors in perception, judgment, and assessment can be minimized by developing multiple, plausible hypotheses. Working from knowledge of the literature on cognitive biases and heuristics from cognitive psychology helps to understand cognitive errors that we as clinicians (and all humans) may need to confront in clinical situations. Additionally, knowledge of the limits of clinical (vs. statistical) prediction can temper some of the reinforcement that being an expert in clinical transactions can carry. Because it is very reinforcing as a clinician to have the client praise you for perceived wisdom, insight, and helpfulness, it is critical to understand that we are wrong more often than we are right in overriding well-established evidence.

### *How can we teach students to become aware of the factors that can lead individuals to conclude that psychotherapies are efficacious even when they are not?*

**RICHARD J. McNALLY:** These issues can best be taught within the required psychotherapy research course in graduate school. In principle, one might cover these topics in general methods and statistics courses. But doing so in the abstract will likely be less pedagogically effective than



doing so in the psychotherapy research course itself.

SCOTT O. LILIENFELD: One great paper along these lines—and one that should be required reading for all clinically oriented students—is Beyerstein (1997). As Beyerstein and others have noted, a host of factors, including regression to the mean, spontaneous remission, placebo effects, demand characteristics, selective attrition, effort justification, and the like, can lead even highly intelligent and thoughtful people to be fooled by therapies that are ineffective, even harmful. In my own teaching, I continually force my students to generate alternative explanations for observations of the apparent positive effects of interventions, and to get them to understand what does—and does not—constitute adequate evidence for the efficacy of a treatment.

JEFFREY M. LOHR: I am not sure that we can teach “awareness” or that awareness is a sufficient condition for the critical analysis of such empirical issues. The teaching of open-minded skepticism and problem-solving skills provides a much stronger basis for evaluating treatment efficacy and effectiveness. The application of experimental analyses to separate common factors from disorder-specific and procedure-specific factors will help in the identification change processes that are supported by scientific evidence. If students also learn the strengths and limitations of intensive (single-subject) experimental methods, they can then be in a better position to replicate additive or subtractive component treatment strategies to the people they serve directly. They will also be better research consumers.

***What is the relevance of critically evaluating therapy research for students who are not interested in a research-oriented career?***

TIMOTHY R. STICKLE: All students, regardless of specific career goals, benefit from training in evaluating therapy and therapy outcome studies. More extensive training in measurement, philosophy of science, research methodology, and statistics is badly needed in our training programs. When one learns to evaluate the strengths and weaknesses of an evidence base, one can be well-informed about the quality of evidence supporting and weakening claims about effectiveness of treatments. Medicine, psychology, and related fields are rich with examples of misguided and ineffective approaches. Clear thinking based on solid

knowledge of how scientific evidence is generated and of its inherent and specific limits puts clinicians and researchers in the strongest position to make informed judgments.

SCOTT O. LILIENFELD: All students—arguably especially those who are not interested in research-oriented careers—need such training. Practitioners need to remain cognizant of the factors that can fool them into concluding that their interventions are working even when they’re not. They also need to become active and discerning consumers of the basic psychology and psychotherapy outcome literatures, and to incorporate basic scientific findings on both (a) the workings of emotions, memory, personality traits, and the like, and (b) comparative treatment efficacy into their clinical practice.

***What strategies should programs use to teach students these important skills?***

RICHARD J. McNALLY: I cover issues such as placebos, regression to the mean, randomization in controlled trials, etc., in various undergraduate courses. For our graduate clinical students, these topics are typically covered in the psychotherapy research course. I believe that when the abstract principles are learned in concrete contexts, students will learn them better than when taught in other contexts (e.g., a generic statistics and methods course).

SCOTT O. LILIENFELD: I think it’s helpful to expose students to the fallible, but nevertheless useful, indicators of pseudoscience, such as overuse of ad hoc hypotheses designed to immunize claims against falsification, absence of self-correction, excessive reliance on anecdotal evidence, and so on. Such indicators can serve as helpful “warning signs” to students that researchers or practitioners are not playing by the rules of science. Of course, it’s also important for students to understand that even scientists occasionally engage in such tactics, so that the distinction between science and pseudoscience isn’t clear-cut. In my experience, many undergraduate and graduate programs accord surprisingly short shrift to these skills. Students need to understand that research designs are critical safeguards against human error. Anyone who doubts this point should watch the 1993 *Frontline* special “The Prisoners of Silence,” which provides a devastating exposé of how psychological research methods demolished

the claims of the proponents of facilitated communication for autism.

***Are these training objectives best addressed in a specific course or integrated across curricula?***

SCOTT O. LILIENFELD: I believe it’s essential that such critical thinking skills not be offered in a single course, but that they instead be integrated throughout the didactic and applied components of the clinical curriculum. Addressing these skills in a single course sends the wrong message—namely, that they are self-contained pieces of knowledge that need to be applied only in certain contexts. As Richard J. McFall (1991) reminds us, clinical psychology students should be operating as scientists in all domains of their clinical research and practice.

TIMOTHY R. STICKLE: Optimally, learning methodology and other key science and pseudoscience content should be integrated into a variety of undergraduate and graduate courses that cover clinical assessment (e.g., clinical vs. statistical prediction), clinical practice (e.g., cognitive biases and heuristics), and statistics and methods (e.g., philosophy of science, causal inference, probabilistic thinking, how form and method of presentation of quantitative information can be misleading).

RICHARD J. McNALLY: For graduate students, this material is best incorporated in preexisting courses. Scientific thinking can best be fostered by taking scientific principles out of abstract methods courses and embedding them in psychotherapy research courses. The problem with having a pseudoscience course at the graduate level is that clinical students may have too many courses to take, which can detract from their research.

JEFFREY M. LOHR: I think we should target undergraduate psychology majors who have intentions of postgraduate training. Perhaps a two-track major would provide for the opportunity to teach the material to graduate school-bound students in their junior or senior year. At the graduate level, I think the material would be best presented in a specific course on critical thinking and analysis, and that such a course should precede or be taught concurrent with the first research methods or statistics course. I believe that spreading it across several teaching contexts would risk dilution of content. In this, I disagree with my colleagues. Without an early instructional focus, the message may be lost.

### *Why do so few programs offer courses in science and pseudoscience?*

SCOTT O. LILIENFELD: I suspect that there's often a sense that pseudoscience isn't especially important in the education and training of mental health professionals because it exists only on the "fringes" of research and practice. Therefore, it can be safely ignored. Many academics seem to hold the view that it's best to let sleeping dogs lie. The problem, of course, is that the dogs aren't sleeping. With the increasing proliferation of fad and fringe therapies of various stripes, it's clear that pseudoscience is alive and well in much of clinical psychology. Indeed, I believe that our benign neglect of psychological pseudoscience has inadvertently laid the groundwork for its continuing popularity. To a substantial extent, it's we academics who are at fault. For example, with only a handful of notable exceptions, the response of the academic clinical science community to the recovered memory and multiple personality disorder crazes over the past several decades has been deafening silence. Regrettably, most of the pressure to curtail the dubious psychological practices that generated these crazes came not from within psychology but from outside of it—from managed care and the legal profession, for example.

JEFFREY M. LOHR: I suspect that many academic faculty are unaware of the nature or dangers of pseudoscientific psychology and its clinical applications. By labeling such dangers as "fringe" phenomenon, it may marginalize our concerns about such dangers. Moreover, I believe many believe that we are somehow "above it all" and that graduate education is somehow immune to such risks. Furthermore, because faculty have a great deal to teach in a limited amount of time, adding new curricular content may require current curricula to be deleted.

TIMOTHY R. STICKLE: In part, the "tail wags the dog" when it comes to curriculum decisions for many training programs. Ph.D. programs in clinical psychology have heavy course demand in order to fulfill accreditation requirements and to prepare students for professional licensing. Additionally, there must be time for essential training experiences in research and treatment. The goals of creating curricula to foster well-trained clinical scientists are not always best served by the many requirements for accreditation and licensure. Many doctoral programs already have average

completion times of beyond 6 years. Emphasis on key domains such as measurement, statistics, and research methodology appears to have declined to levels that are troubling (Aiken, West, Sechrest, & Reno, 1990). Adding additional courses to demanding and apparently lengthening training programs is difficult.

### *What is the role of professional organizations?*

SCOTT O. LILIENFELD: Professional organizations, such as APA, APS, and ABCT, should be on the forefront of combating unsubstantiated or invalid claims regarding psychotherapy and assessment. They should be responding forcefully to counteract inaccurate media coverage of mental health practice; they should be encouraging continuing education programs and workshops based on sound psychological science; and they should be promoting initiatives to develop undergraduate and graduate curricula focusing on the application of critical thinking skills to psychotherapy and assessment.

### *What specific recommendations would you give to improve training and foster scientific thinking?*

TIMOTHY R. STICKLE: The key change I recommend, beyond those implied above, is to increase the direct involvement of faculty members in both research and clinical training. In many doctoral clinical training programs, the primary activity of core faculty is research. This is not entirely problematic and it has many desirable effects. The result for clinical training, however, is that many programs collaborate with community clinicians to provide most or all clinical training for clinical scientist trainees. This is unfortunate for several reasons. First, the so-called science-practice split is inadvertently reinforced when students have mostly or exclusively separate experiences with individuals who provide training in either research or clinical work. Rather than an integrated clinical science curriculum involving didactics, research experiences, and clinical supervision with an integrated set of scientific values, goals, and key experiences, present training approaches frequently offer little integration and consistency among these components. Although many collaborating community clinicians provide excellent training and training that is consistent with program goals and scientific values, this is also often not the case.

For example, although all Ph.D. programs in clinical psychology offer some kind of training in at least one evidence-based treatment (EBT), only 56% of these programs require both didactic training and clinical supervision in at least one EBT (Weissman et al., 2006). One alternative is to provide clinical training primarily "in-house," under the direction of core faculty members or a primary faculty member hired for this function. This approach offers several advantages for the goal of teaching students to think and act as scientists. Graduate students should be actively involved in research programs and in evidence-based clinical training across all years of graduate training. When core faculty direct training, students can observe and model the behavior of faculty who are active in research and in clinical training. However, this approach would require programs to persuade department and university administration that clinical training should be credited to faculty workload. Providing clinical supervision can be time intensive and faculty should be credited with the same time as teaching a classroom-based course. If clinical training remains an added activity on top of teaching, research, graduate student supervision, and so forth, it will not be adopted because it will impede the ability of junior faculty to develop and sustain research programs and to be promoted and it will impede senior faculty in sustaining research programs.

JEFFREY M. LOHR: The process needs to start earlier than postsecondary education. Most secondary science education involves the accumulation and assemblage of "facts" as end-products of the scientific enterprise. However, the most important part of science education focuses on the process by which knowledge is slowly accumulated in the face of ignorance. Skeptical open-mindedness is difficult to find and even more difficult to teach in the face of fact accumulators. I suggest that general science education should incorporate the work of people like Sagan (1986) and Feynman (2005), who can help students appreciate the critical thinking process as a way recognizing ignorance and how to sift through piles of "facts." That can be done in the domain of the life and physical sciences, but it might have more impact if done in the domain of the social sciences, like psychology, where the students live on a day-to-day basis. If this can be done, we might attract more open-minded skeptics to major in psychology who might make their way to graduate studies in psychological science.

# Any final thoughts on the best way to maintain a healthy balance between cynicism and credulity?

JEFFREY M. LOHR: The first step is to distinguish cynicism from skepticism. I think most students and professors think this is a semantic quibble. It is not. Cynicism is founded in suspicion. Skepticism is founded on humility-based doubt. It is the distinction between "Who cares?" and "I want to know more and better." Teaching not only "the burden of skepticism" (Sagan, 1987) but the kind of skepticism that leads to the joy of discovery is an essential educational task.

SCOTT O. LILIENFELD: My office door at Emory University features a piece of paper reminding visitors of Oberg's dictum, named after space engineer James Oberg: "Keeping an open mind is a virtue, just so long as it's not so open that our brains fall out." The best means of achieving this balance is to avoid a dismissive posture and to be just as critical of individuals who prematurely dismiss novel claims as we are of those who prematurely promote and market such claims before they have been subjected to empirical scrutiny. We need to model open-minded skepticism for our students. The best means of doing this is to remind them of the Missouri state motto: SHOW ME. As Dawes (2003), points out, "show me" should always be the proper epistemic stance of the clinical scientist. Clinical scientists should promote an attitude of being willing to investigate novel claims, but of suspending acceptance of these claims before they have passed adequate scientific tests.

RICHARD J. McNALLY: Students must learn that no study is perfect, and that all studies have their limitations. Accordingly, the key question for them to ask is, *Given its strengths and limitations, what can this study tell us? What can we reasonably infer about the efficacy of this therapy?* They must also learn to ask, *How do you know? What is the evidence?* when a person makes a claim about a therapy. They should not confuse epistemic nihilism or cynicism with sophistication. Both cynicism and credulity are forms of intellectual laziness, and both are substitutes for thought. The best way to maintain a healthy balance is to keep one's eyes focused on the important questions and on the evidence.

TIMOTHY R. STICKLE: Albert Einstein is credited with saying, "All our science, measured against reality, is primitive and childlike—and yet it is the most precious

thing we have." I try to remember that although I believe a scientific approach to psychology is the best we have, it is imperfect and incomplete. Remaining open-minded is essential or our approach becomes ideological and ceases to be scientific.

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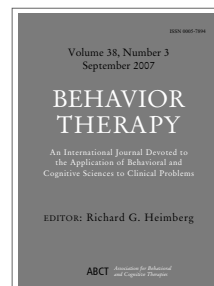
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## Master's Training in Applied Psychology

Farrah M. Hughes, *Francis Marion University*, and Steven J. Haggbloom, *Chair of the Executive Committee of the Council of Applied Master's Programs in Psychology and Western Kentucky University*

As faculty members who are actively engaged in the education and training of master's-level psychologists, we were pleased to read the Training Program Update regarding master's programs in behavior therapy (Evans & Timmins, 2005). That article was concerned primarily with master's programs that prepare students for doctoral-level training. Our purpose is to comment on the importance of terminal, applied master's programs in psychology, to encourage such programs to formally adopt the training standards of the Council of Applied Master's Programs in Psychology (CAMPP) through CAMPP membership, and to briefly describe some CAMPP-member programs that have a primarily behavioral or cognitive-behavioral orientation.

We do not need to tell you that the existence of terminal master's programs in psychology has for many decades been a controversial issue, one that remains unresolved today. On the one hand, APA has long maintained that the entry-level degree for psychological licensure and clinical practice be the doctoral degree. On the other hand, the reality is that approximately 6,000 master's-level practitioners graduate each year from about 270 terminal master's programs in applied psychology, which has created a unique situation for these graduates in terms of professional identity (Cummings, 1995; Duer & Hays-Thomas, 2005). While they are trained to provide many psychological services, this training is not recognized in many states and, as a result, these practitioners often must seek licensure under statutes and titles that pertain to other training modalities, such as counseling (Hays-Thomas, Hanson, & Moseley, 2002). This situation forces them to satisfy educational and training requirements for disciplines other than psychology. Although they warrant elaboration and discussion, the many implications of such licensing and training issues are beyond the scope of this article; please see Duer and Hays-Thomas (2005) for a more thorough discussion.

Despite the relatively young history of master's-level training in applied psychology (i.e., relative to other disciplines in which master's-level training is widely available and highly valued, such as social work and marriage and family therapy) and the many challenges that it currently is facing, master's-level psychologists are increasing in number and provide a variety of clinical services in many settings. Humphreys (1996) keenly acknowledged this growing reality and highlighted several ways that master's- and doctoral-level psychologists can work together to meet mental health needs in this country. As Humphreys noted, one cannot deny the reality that HMOs have increasingly made use of master's-level practitioners to provide mental health services (Cheifetz & Salloway, 1984). Moreover, master's-level psychologists very often provide services in community and state mental health centers, frequently filling positions for which doctoral-level psychologists are overqualified (Richert & Fulkerson, 1987; Trent, 1993). These practitioners are viewed positively by their supervisors, and agency directors have reported that a lack of master's-level practitioners would be detrimental to their ability to provide adequate services (e.g., Colliver, Havens, & Wesley, 1985).

Because of the rapid growth that has occurred in master's-level psychological training, the large contribution of master's-level psychologists to meeting the need for psychological services, and the fact that APA does not accredit master's-level programs in applied psychology, we believe it is critical for such programs to adopt the CAMPP training standards (for information about CAMPP and to access the training standards, visit <http://www.camppsite.org/>). CAMPP membership certifies compliance with the CAMPP training standards and thereby serves to increase the confidence of the professional psychology community and the public in the education and training of master's-level providers of psychological services. It should be noted that although CAMPP is not an accrediting agency, the Master's in Psychology Accreditation

Council's (MPAC) requirements for accreditation are based on CAMPP training standards. In addition, master's-level licensure in Vermont is explicitly tied to the CAMPP standards.

We thought that ABCT members would be interested in knowing about CAMPP-member clinical programs that have a primarily cognitive-behavioral theory (CBT) orientation. To gather more information about these programs, we conducted an e-mail survey of the 70 CAMPP-member programs. We received 20 responses (28.6%), 3 of which simply indicated that the program was in industrial/organizational or some other non-clinical applied area. In response to the question, "Is the orientation of your program primarily cognitive-behavioral?" 9 of the remaining 17 programs responded "yes," and 8 other programs identified themselves as eclectic or generalist, but noted that students receive some CBT training.

We also asked, "If your program has a cognitive-behavioral orientation, what types of CBT courses or training do you offer, or how is your program/training structured so as to have a CBT orientation?" Among the CBT programs, five had from two to four courses with a primarily or exclusively CBT orientation built into their curriculum, one program had one such course, one program had six, and one program had no such courses but reported that they instead relied on the CBT orientation of faculty to ensure CBT course content. Four eclectic programs also answered this item, with only one claiming a primarily CBT course. The other three eclectic programs noted that faculty orientation ensured some CBT coverage. In response to a question about types of practica and internships, the CBT programs noted that these experiences included opportunities to develop and practice CBT skills.


Five of the responding CBT programs graduate from 5 to 8 students per year, two graduate 10 to 12, and one graduates 20 to 25. In response to a question about the percentage of graduates going on to psychology Ph.D. or Psy.D. programs, four of the CBT programs gave an estimate in the 10% to 30% range, two said 50%, and two gave an estimate in the 60% to 80% range. Thus, it appears that while many students seek to further their training in doctoral-level programs, a large percentage of graduates from the programs who participated in our informal survey enter the field as master's-level practitioners. This finding is consistent with the literature highlighting the

usefulness and importance of master's-level practitioners in mental health settings.

In summary, many terminal master's programs in applied psychology exist, yet the recognition of these programs is relatively new, as is the concept of licensing and credentialing graduates from these programs. Because master's-level practitioners provide many invaluable services in a variety of clinical settings, because their number is growing, and because APA does not accredit master's-level programs in applied psychology, we encourage these programs to explore CAMPP membership and MPAC accreditation. In particular, we urge programs with a CBT orientation to utilize these organizations and the credentialing process to enhance the visibility of master's-level training in CBT and to increase the confidence of the public in practitioners who are trained as masters in psychology.

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## In Defense of Proliferating Diagnoses

Alex Cogswell and Robert M. Holaway, *Temple University*

In considering the best criteria by which to judge scientific progress, some of our colleagues would undoubtedly cite the work of Carl Hempel, whose covering law and its derivative notions he promoted quite extensively. According to Hempel (1965), science progresses when fewer and fewer constructs are needed to explain the phenomena of interest, or fewer laws serve to cover more ground. Of course, while Hempel was able to successfully persuade many, his position is not without flaws. Perhaps the greatest of these flaws is that Hempel's position might be viewed as a critique of the current state of clinical psychology.

We have taken it upon ourselves to celebrate the progress our field has made and, once and for all, silence the nagging Hempelians who seem to roam the halls of every academic institution. The sons and daughters of antipsychiatry are frequently the most vocal, viewing with suspicion the *proliferation* of diagnoses from one *DSM* to the next. Such suspicions seem more suited to debates over nuclear disarmament than psychiatric nosology. Mere use of the word *proliferation* invokes value judgments—it is a loaded term that promotes condemnation of the ever-increasing number of diagnostic conditions prized in contemporary

psychology and psychiatry. On a more positive note, we make the humble suggestion that researchers adopt the lexical substitution of *increased discovery* for *proliferation*.

In 1952, *DSM-I* was published with a mere 60 diagnoses, as compared to *DSM-IV-TR*, which only a half century later contained upwards of 300 diagnostic categories. If this is not progress, we demand to know what is! Could Hempel possibly make the case that clinical science was more advanced in 1952 than it was in 2000? Clearly, he would not, though we would not be surprised to hear such a case made by the iconoclastic Hempelian malcontents who occasionally voice equally ludicrous positions (e.g., “*New* psychological disorders are simply reifications of problems in living,” or “Who cares what your factor analysis says? Grief-related depression and complicated bereavement are the same thing”). It is evident to the thoughtful among us that while arguments such as these are easily dismissible, it is regrettably still necessary to pay them occasional heed, if only to avoid fostering the kind of academic martyrdom where Hempelian fanatics might feel empowered by their irrelevance to the mainstream literature.

We hope that tensions between “less is more” Hempelians and the rest of us, who

see “increased discovery” as hard evidence for scientific progress, can be resolved as follows. As mentioned above, from the first *DSM* to the most recent, the number of discrete diagnostic categories has increased 583%. Over the same time span, the population of the United States has increased 85%. Just 5 minutes with a calculator revealed that if these trends continue, only a handful of thousands of years will pass before the number of U.S. residents and number of psychiatric diagnoses are the same. Thus, while a “trillionth diagnosis discovered” party at ABCT might make Hempel turn over in his grave, it should make the sane among us smile to imagine such an event.

Others might argue that a unique diagnostic label for each living U.S. resident will indicate a failure of our diagnostic system. We argue precisely the opposite. Only when each living U.S. resident enjoys his or her own diagnostic label can it be convincingly argued that our pursuit of categorization has succeeded—that is, by generating a label for every woman, man, and child, and finally descending into idiosyncrasy.

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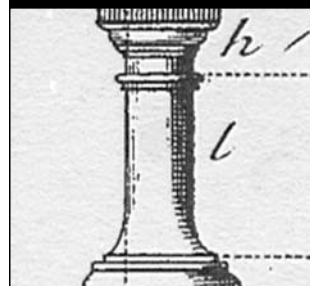
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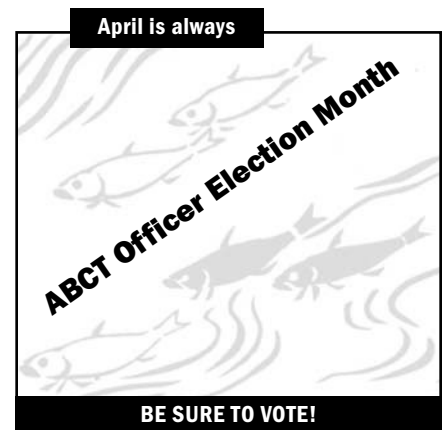
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### • ORIGINAL RESEARCH

#### **Armento & Hopko**

The Environmental Reward Observation Scale (EROS): Development, Validity, and Reliability

#### **Hsu & Alden**

Social Anxiety in Chinese- and European-Heritage Students: The Effect of Assessment Format and Judgments of Impairment

#### **Leahey et al.**

The Frequency, Nature, and Effects of Naturally Occurring Appearance-Focused Social Comparisons

#### **Moore & Fresco**

Depressive Realism and Attributional Style: Implications for Individuals at Risk for Depression

#### **Sloan et al.**

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#### **Dugas et al.**

Can the Components of a Cognitive Model Predict the Severity of Generalized Anxiety Disorder?

#### **Tolin et al.**

A Randomized Controlled Trial of Self-Directed Versus Therapist-Directed Cognitive-Behavioral Therapy for Obsessive-Compulsive Disorder Patients With Prior Medication Trials

#### **Rodebaugh et al.**

The Reverse of Social Anxiety Is Not Always the Opposite: The Reverse-Scored Items of the Social Interaction Anxiety Scale Do Not Belong

## Cognitive and Behavioral Practice

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### • COGNITIVE BEHAVIORAL CASE CONFERENCE

**Valmaggia et al.** Attention Training With Auditory Hallucinations: A Case Study • **Wells.** The Attention Training Technique: Theory, Effects, and a Metacognitive Hypothesis on Auditory Hallucinations • **Cather.** Attention Training: A Novel Treatment Approach to Auditory Hallucinations • **Morrison.** The Use of Attention Training With Voice Hearers May Reduce Distress and Improve Quality of Life • **Tarrier.** What's in a Name? A Commentary on Valmaggia et al.'s "Attention Training With Auditory Hallucinations"

### • REGULAR ARTICLES

**Lindenboim et al.** Skills Practice in Dialectical Behavior Therapy for Suicidal Women Meeting Criteria for Borderline Personality Disorder

**Safer et al.** Dialectical Behavior Therapy Modified for Adolescent Binge Eating Disorder: A Case Report

**Gorenstein et al.** Cognitive-Behavior Therapy for Reduction of Persistent Anger

**González-Prendes.** Cognitive-Behavioral Treatment of Men and Anger: Three Single Case Studies

**Anderson et al.** Usability and Utility of a Computerized Cognitive-Behavioral Self-Help Program for Public Speaking Anxiety

**Morasco et al.** Psychological Factors That Promote and Inhibit Pathological Gambling

**Jakobsons et al.** When Are Clients Ready to Terminate?

**Rabinowitz et al.** Clinical Application of a Behavioral Model for the Treatment of Body Dysmorphic Disorder

### • BOOK REVIEWS

Wilhelm (2006), *Feeling Good About the Way You Look: A Program for Overcoming Body Image Problems*, reviewed by Feusner • Bourne (2005), *The Anxiety and Phobia Workbook* (4th ed.), reviewed by Olatunji & Elwood

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